

# SEQUENCE LISTING

<110> Watson, James D.  
Tan, Paul L. J.

<120> Methods and Compounds for the Treatment  
of Immunologically-Mediated Diseases of the Respiratory  
System using Mycobacterium Vaccae

<130> 11000.1008c2

<150> US09/156,181

<151> 1998-09-17

<150> US 08/996,624

<151> 1997-12-23

<160> 208

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 25

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE

<222> (7)...(7)

<400> 1

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Pro | Val | Gly | Pro | Gly | Xaa | Ala | Ala | Tyr | Val | Gln | Gln | Val | Pro | Asp |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Gly | Pro | Gly | Ser | Val | Gln | Gly | Met | Ala |     |     |     |     |     |     |     |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     |     |     |     |     |

<210> 2

<211> 10

<212> PRT

<213> Mycobacterium vaccae

<220>

<221> UNSURE

<222> (2)...(2)

<400> 2

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Xaa | Asp | Gln | Leu | Lys | Val | Asn | Asp | Asp |
| 1   |     |     |     | 5   |     |     |     | 10  |     |

<210> 3

<211> 11

<212> PRT

<213> Mycobacterium vaccae

<220>

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<221> UNSURE  
<222> (2)...(2)

<400> 3

Met Xaa Pro Val Pro Val Ala Thr Ala Ala Tyr  
1 5 10

<210> 4  
<211> 21  
<212> PRT  
<213> Mycobacterium vaccae

<400> 4

Thr Pro Ala Pro Ala Pro Pro Tyr Val Asp His Val Glu Gln Ala  
1 5 10 15  
Lys Phe Gly Asp Leu  
20

<210> 5  
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<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (25)...(25)

<400> 5

Met Gln Ala Phe Asn Ala Asp Ala Tyr Ala Phe Ala Lys Arg Glu Lys  
1 5 10 15  
Val Ser Leu Ala Pro Gly Val Pro Xaa Val Phe Glu Thr  
20 25

<210> 6  
<211> 21  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (6)...(6)

<400> 6

Met Ala Asp Pro Asn Xaa Ala Ile Leu Gln Val Ser Lys Thr Thr Arg  
1 5 10 15  
Gly Gly Gln Ala Ala  
20

<210> 7  
<211> 11  
<212> PRT  
<213> Mycobacterium vaccae

<400> 7

Met Pro Ile Leu Gln Val Ser Gln Thr Gly Arg  
1 5 10

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<210> 8  
 <211> 14  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (2)...(2)

<221> UNSURE  
 <222> (6)...(6)

<400> 8  
 Met Xaa Asp Pro Ile Xaa Leu Gln Leu Gln Val Ser Ser Thr  
 1 5 10

<210> 9  
 <211> 16  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 9  
 Lys Ala Thr Tyr Val Gln Gly Gly Leu Gly Arg Ile Glu Ala Arg Val  
 1 5 10 15

<210> 10  
 <211> 9  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (2)...(2)

<400> 10  
 Lys Xaa Gly Leu Ala Asp Leu Ala Pro  
 1 5

<210> 11  
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 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (12)...(12)  
 <223> Residue can be either Glu or Ile

<221> UNSURE  
 <222> (2)...(2)

<400> 11  
 Lys Xaa Tyr Ala Leu Ala Leu Met Ser Ala Val Xaa Ala Ala  
 1 5 10

<210> 12  
 <211> 11

10051543-011802

<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (10)...(10)

<400> 12  
Lys Asn Pro Gln Val Ser Asp Glu Leu Xaa Thr  
1 5 10

<210> 13  
<211> 21  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (9)...(9)

<400> 13  
Ala Pro Ala Pro Ala Ala Pro Ala Xaa Gly Asp Pro Ala Ala Val Val  
1 5 10 15  
Ala Ala Met Ser Thr  
20

<210> 14  
<211> 15  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (5)...(5)

<400> 14  
Glu Ala Glu Val Xaa Tyr Leu Gly Gln Pro Gly Glu Leu Val Asn  
1 5 10 15

<210> 15  
<211> 15  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (2)...(2)  
<223> Residue can be either Gly or Ala

<221> UNSURE  
<222> (15)...(15)  
<223> Residue can be either Pro or Ala

<221> UNSURE  
<222> (7)...(7)

<400> 15

Ala Xaa Val Val Pro Pro Xaa Gly Pro Pro Ala Pro Gly Ala Xaa  
 1 5 10 15

<210> 16  
 <211> 15  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 16

Ala Pro Ala Pro Asp Leu Gln Gly Pro Leu Val Ser Thr Leu Ser  
 1 5 10 15

<210> 17  
 <211> 25  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 17

Ala Thr Pro Asp Trp Ser Gly Arg Tyr Thr Val Val Thr Phe Ala Ser  
 1 5 10 15  
 Asp Lys Leu Gly Thr Ser Val Ala Ala  
 20 25

<210> 18  
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 <212> PRT  
 <213> Mycobacterium vaccae

<220>

<221> UNSURE  
 <222> (15)...(15)  
 <223> Residue can be either Ala or Arg

<221> UNSURE  
 <222> (23)...(23)  
 <223> Residue can be either Val or Leu

<221> UNSURE

<222> (16)...(16)

<400> 18

Ala Pro Pro Tyr Asp Asp Arg Gly Tyr Val Asp Ser Thr Ala Xaa Xaa  
 1 5 10 15  
 Ala Ser Pro Pro Thr Leu Xaa Val Val  
 20 25

<210> 19  
 <211> 8  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 19

Glu Pro Glu Gly Val Ala Pro Pro  
 1 5

<210> 20  
 <211> 25

20051643-011802

<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (21)...(22)

<400> 20  
Glu Pro Ala Gly Ile Pro Ala Gly Phe Pro Asp Val Ser Ala Tyr Ala  
1 5 10 15  
Ala Val Asp Pro Xaa Xaa Tyr Val Val  
20 25

<210> 21  
<211> 15  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (7)...(7)

<400> 21  
Ala Pro Val Gly Pro Gly Xaa Ala Ala Tyr Val Gln Gln Val Pro  
1 5 10 15

<210> 22  
<211> 15  
<212> PRT  
<213> Mycobacterium vaccae

<400> 22  
Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr Leu Met Val Pro Ser  
1 5 10 15

<210> 23  
<211> 19  
<212> PRT  
<213> Mycobacterium vaccae

<400> 23  
Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr Leu Met Val Pro Ser Pro  
1 5 10 15  
Ser Met Gly

<210> 24  
<211> 15  
<212> PRT  
<213> Mycobacterium vaccae

<400> 24  
Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr Leu Asp Val Phe Ser  
1 5 10 15

<210> 25  
<211> 14

10051643-011802

<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (1)...(2)

<400> 25  
Xaa Xaa Thr Gly Leu His Arg Leu Arg Met Met Val Pro Asn  
1 5 10

<210> 26  
<211> 20  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (16)...(16)  
<223> Residue can be either Ser or Val

<221> UNSURE  
<222> (17)...(17)  
<223> Residue can be either Gln or Val

<400> 26  
Val Pro Ala Asp Pro Val Gly Ala Ala Ala Gln Ala Glu Pro Ala Xaa  
1 5 10 15  
Xaa Arg Ile Asp  
20

<210> 27  
<211> 14  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (4)...(4)  
<223> Residue can be either Tyr or Pro

<221> UNSURE  
<222> (8)...(8)  
<223> Residue can be either Val or Gly

<221> UNSURE  
<222> (9)...(9)  
<223> Residue can be either Ile or Tyr

<221> UNSURE  
<222> (3)...(3)

<400> 27  
Asp Pro Xaa Xaa Asp Ile Glu Xaa Xaa Phe Ala Arg Gly Thr  
1 5 10

<210> 28

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<211> 15  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 28  
 Ala Pro Ser Leu Ser Val Ser Asp Tyr Ala Arg Asp Ala Gly Phe  
 1 5 10 15

<210> 29  
 <211> 16  
 <212> PRT  
 <213> Mycobacterium vaccae

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 <222> (2)...(2)  
 <223> Residue can be either Leu or Pro

<221> UNSURE  
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<221> UNSURE  
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<221> UNSURE  
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<221> UNSURE  
 <222> (10)...(10)

<400> 29  
 Xaa Xaa Leu Ala Xaa Ala Xaa Leu Gly Xaa Thr Val Asp Ala Asp Gln  
 1 5 10 15

<210> 30  
 <211> 330  
 <212> PRT  
 <213> Mycobacterium leprae

<400> 30  
 Met Lys Phe Val Asp Arg Phe Arg Gly Ala Val Ala Gly Met Leu Arg  
 1 5 10 15  
 Arg Leu Val Val Glu Ala Met Gly Val Ala Leu Leu Ser Ala Leu Ile  
 20 25 30  
 Gly Val Val Gly Ser Ala Pro Ala Glu Ala Phe Ser Arg Pro Gly Leu  
 35 40 45  
 Pro Val Glu Tyr Leu Gln Val Pro Ser Pro Ser Met Gly Arg Asp Ile  
 50 55 60  
 Lys Val Gln Phe Gln Asn Gly Gly Ala Asn Ser Pro Ala Leu Tyr Leu  
 65 70 75 80  
 Leu Asp Gly Leu Arg Ala Gln Asp Asp Phe Ser Gly Trp Asp Ile Asn  
 85 90 95  
 Thr Thr Ala Phe Glu Trp Tyr Tyr Gln Ser Gly Ile Ser Val Val Met  
 100 105 110  
 Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala  
 115 120 125  
 Cys Gly Lys Ala Gly Cys Gln Thr Tyr Lys Trp Glu Thr Phe Leu Thr

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|   |     |     |
|---|-----|-----|
| 130   | 135 | 140 |
| Ser Glu Leu Pro Glu Tyr Leu Gln Ser Asn Lys Gln Ile Lys Pro Thr |     |     |
| 145   | 150 | 155 |
| Gly Ser Ala Ala Val Gly Leu Ser Met Ala Gly Leu Ser Ala Leu Thr |     | 160 |
|   | 165 | 170 |
| Leu Ala Ile Tyr His Pro Asp Gln Phe Ile Tyr Val Gly Ser Met Ser |     | 175 |
|   | 180 | 185 |
| Gly Leu Leu Asp Pro Ser Asn Ala Met Gly Pro Ser Leu Ile Gly Leu |     | 190 |
|   | 195 | 200 |
| Ala Met Gly Asp Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro |     | 205 |
|   | 210 | 215 |
| Ser Thr Asp Pro Ala Trp Lys Arg Asn Asp Pro Thr Val Asn Val Gly |     | 220 |
| 225   | 230 | 235 |
| Thr Leu Ile Ala Asn Asn Thr Arg Ile Trp Met Tyr Cys Gly Asn Gly |     | 240 |
|   | 245 | 250 |
| Lys Pro Thr Glu Leu Gly Gly Asn Asn Leu Pro Ala Lys Leu Leu Glu |     | 255 |
|   | 260 | 265 |
| Gly Leu Val Arg Thr Ser Asn Ile Lys Phe Gln Asp Gly Tyr Asn Ala |     | 270 |
|   | 275 | 280 |
| Gly Gly Gly His Asn Ala Val Phe Asn Phe Pro Asp Ser Gly Thr His |     | 285 |
|   | 290 | 295 |
| Ser Trp Glu Tyr Trp Gly Glu Gln Leu Asn Asp Met Lys Pro Asp Leu |     | 300 |
| 305   | 310 | 315 |
| Gln Gln Tyr Leu Gly Ala Thr Pro Gly Ala                         |     | 320 |
|   | 325 | 330 |

<210> 31  
 <211> 327  
 <212> PRT  
 <213> Mycobacterium leprae

|   |
|---|
| <400> 31  |
| Met Ile Asp Val Ser Gly Lys Ile Arg Ala Trp Gly Arg Trp Leu Leu |
| 1 5 10 15   |
| Val Gly Ala Ala Thr Leu Pro Ser Leu Ile Ser Leu Ala Gly Gly     |
| 20 25 30  |
| Ala Ala Thr Ala Ser Ala Phe Ser Arg Pro Gly Leu Pro Val Glu Tyr |
| 35 40 45  |
| Leu Gln Val Pro Ser Glu Ala Met Gly Arg Thr Ile Lys Val Gln Phe |
| 50 55 60  |
| Gln Asn Gly Gly Asn Gly Ser Pro Ala Val Tyr Leu Leu Asp Gly Leu |
| 65 70 75 80   |
| Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr Ser Ala Phe |
| 85 90 95  |
| Glu Trp Tyr Tyr Gln Ser Gly Leu Ser Val Val Met Pro Val Gly Gly |
| 100 105 110   |
| Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala Cys Gly Lys Ala |
| 115 120 125   |
| Gly Cys Thr Thr Tyr Lys Trp Glu Thr Phe Leu Thr Ser Glu Leu Pro |
| 130 135 140   |
| Lys Trp Leu Ser Ala Asn Arg Ser Val Lys Ser Thr Gly Ser Ala Val |
| 145 150 155 160   |
| Val Gly Leu Ser Met Ala Gly Ser Ser Ala Leu Ile Leu Ala Ala Tyr |
| 165 170 175   |
| His Pro Asp Gln Phe Ile Tyr Ala Gly Ser Leu Ser Ala Leu Met Asp |
| 180 185 190   |
| Ser Ser Gln Gly Ile Glu Pro Gln Leu Ile Gly Leu Ala Met Gly Asp |

|   |     |     |
|---|-----|-----|
| 195   | 200 | 205 |
| Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro Pro Asn Asp Pro |     |     |
| 210   | 215 | 220 |
| Ala Trp Gln Arg Asn Asp Pro Ile Leu Gln Ala Gly Lys Leu Val Ala |     |     |
| 225   | 230 | 235 |
| Asn Asn Thr His Leu Trp Val Tyr Cys Gly Asn Gly Thr Pro Ser Glu |     |     |
| 245   | 250 | 255 |
| Leu Gly Gly Thr Asn Val Pro Ala Glu Phe Leu Glu Asn Phe Val His |     |     |
| 260   | 265 | 270 |
| Gly Ser Asn Leu Lys Phe Gln Asp Ala Tyr Asn Gly Ala Gly Gly His |     |     |
| 275   | 280 | 285 |
| Asn Ala Val Phe Asn Leu Asn Ala Asp Gly Thr His Ser Trp Glu Tyr |     |     |
| 290   | 295 | 300 |
| Trp Gly Ala Gln Leu Asn Ala Met Lys Pro Asp Leu Gln Asn Thr Leu |     |     |
| 305   | 310 | 315 |
| Met Ala Val Pro Arg Ser Gly                                     |     |     |
| 325   |     |     |

<210> 32  
 <211> 338  
 <212> PRT  
 <213> Mycobacterium tuberculosis

|   |
|---|
| <400> 32  |
| Met Gln Leu Val Asp Arg Val Arg Gly Ala Val Thr Gly Met Ser Arg |
| 1 5 10 15   |
| Arg Leu Val Val Gly Ala Val Gly Ala Ala Leu Val Ser Gly Leu Val |
| 20 25 30  |
| Gly Ala Val Gly Gly Thr Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly |
| 35 40 45  |
| Leu Pro Val Glu Tyr Leu Gln Val Pro Ser Pro Ser Met Gly Arg Asp |
| 50 55 60  |
| Ile Lys Val Gln Phe Gln Ser Gly Gly Ala Asn Ser Pro Ala Leu Tyr |
| 65 70 75 80   |
| Leu Leu Asp Gly Leu Arg Ala Gln Asp Asp Phe Ser Gly Trp Asp Ile |
| 85 90 95  |
| Asn Thr Pro Ala Phe Glu Trp Tyr Asp Gln Ser Gly Leu Ser Val Val |
| 100 105 110   |
| Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Gln Pro |
| 115 120 125   |
| Ala Cys Gly Lys Ala Gly Cys Gln Thr Tyr Lys Trp Glu Thr Phe Leu |
| 130 135 140   |
| Thr Ser Glu Leu Pro Gly Trp Leu Gln Ala Asn Arg His Val Lys Pro |
| 145 150 155 160   |
| Thr Gly Ser Ala Val Val Gly Leu Ser Met Ala Ala Ser Ser Ala Leu |
| 165 170 175   |
| Thr Leu Ala Ile Tyr His Pro Gln Gln Phe Val Tyr Ala Gly Ala Met |
| 180 185 190   |
| Ser Gly Leu Leu Asp Pro Ser Gln Ala Met Gly Pro Thr Leu Ile Gly |
| 195 200 205   |
| Leu Ala Met Gly Asp Ala Gly Tyr Lys Ala Ser Asp Met Trp Gly     |
| 210 215 220   |
| Pro Lys Glu Asp Pro Ala Trp Gln Arg Asn Asp Pro Leu Leu Asn Val |
| 225 230 235 240   |
| Gly Lys Leu Ile Ala Asn Asn Thr Arg Val Trp Val Tyr Cys Gly Asn |
| 245 250 255   |
| Gly Lys Pro Ser Asp Leu Gly Gly Asn Asn Leu Pro Ala Lys Phe Leu |

**SECRET**

<400> 33

11



<212> PRT  
<213> Mycobacterium bovis

<400> 35

Met Thr Asp Val Ser Arg Lys Ile Arg Ala Trp Gly Arg Arg Leu Met  
1 5 10 15  
Ile Gly Thr Ala Ala Ala Val Val Leu Pro Gly Leu Val Gly Leu Ala  
20 25 30  
Gly Gly Ala Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly Leu Pro Val  
35 40 45  
Glu Tyr Leu Gln Val Pro Ser Pro Ser Met Gly Arg Asp Ile Lys Val  
50 55 60  
Gln Phe Gln Ser Gly Gly Asn Asn Ser Pro Ala Val Tyr Leu Leu Asp  
65 70 75 80  
Gly Leu Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr Pro  
85 90 95  
Ala Phe Glu Trp Tyr Tyr Gln Ser Gly Leu Ser Ile Val Met Pro Val  
100 105 110  
Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Ser Pro Ala Cys Gly  
115 120 125  
Lys Ala Gly Cys Gln Thr Tyr Lys Trp Glu Thr Leu Leu Thr Ser Glu  
130 135 140  
Leu Pro Gln Trp Leu Ser Ala Asn Arg Ala Val Lys Pro Thr Gly Ser  
145 150 155 160  
Ala Ala Ile Gly Leu Ser Met Ala Gly Ser Ser Ala Met Ile Leu Ala  
165 170 175  
Ala Tyr His Pro Gln Gln Phe Ile Tyr Ala Gly Ser Leu Ser Ala Leu  
180 185 190  
Leu Asp Pro Ser Gln Gly Met Gly Leu Ile Gly Leu Ala Met Gly Asp  
195 200 205  
Ala Gly Gly Tyr Lys Ala Ala Asp Met Trp Gly Pro Ser Ser Asp Pro  
210 215 220  
Ala Trp Glu Arg Asn Asp Pro Thr Gln Gln Ile Pro Lys Leu Val Ala  
225 230 235 240  
Asn Asn Thr Arg Leu Trp Val Tyr Cys Gly Asn Gly Thr Pro Asn Glu  
245 250 255  
Leu Gly Gly Ala Asn Ile Pro Ala Glu Phe Leu Glu Asn Phe Val Arg  
260 265 270  
Ser Ser Asn Leu Lys Phe Gln Asp Ala Tyr Lys Pro Ala Gly Gly His  
275 280 285  
Asn Ala Val Phe Asn Phe Pro Pro Asn Gly Thr His Ser Trp Glu Tyr  
290 295 300  
Trp Gly Ala Gln Leu Asn Ala Met Lys Gly Asp Leu Gln Ser Ser Leu  
305 310 315 320  
Gly Ala Gly

<210> 36  
<211> 333  
<212> PRT  
<213> Mycobacterium leprae

<400> 36

Met Lys Phe Leu Gln Gln Met Arg Lys Leu Phe Gly Leu Ala Ala Lys  
1 5 10 15  
Phe Pro Ala Arg Leu Thr Ile Ala Val Ile Gly Thr Ala Leu Leu Ala  
20 25 30

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Gly Leu Val Gly Val Val Gly Asp Thr Ala Ile Ala Val Ala Phe Ser  
35 40 45  
Lys Pro Gly Leu Pro Val Glu Tyr Leu Gln Val Pro Ser Pro Ser Met  
50 55 60  
Gly His Asp Ile Lys Ile Gln Phe Gln Gly Gly Gly Gln His Ala Val  
65 70 75 80  
Tyr Leu Leu Asp Gly Leu Arg Ala Gln Glu Asp Tyr Asn Gly Trp Asp  
85 90 95  
Ile Asn Thr Pro Ala Phe Glu Glu Tyr Tyr His Ser Gly Leu Ser Val  
100 105 110  
Ile Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser Asn Trp Tyr Gln  
115 120 125  
Pro Ser Gln Gly Asn Gly Gln His Tyr Thr Tyr Lys Trp Glu Thr Phe  
130 135 140  
Leu Thr Gln Glu Met Pro Ser Trp Leu Gln Ala Asn Lys Asn Val Leu  
145 150 155 160  
Pro Thr Gly Asn Ala Ala Val Gly Leu Ser Met Ser Gly Ser Ser Ala  
165 170 175  
Leu Ile Leu Ala Ser Tyr Tyr Pro Gln Gln Phe Pro Tyr Ala Ala Ser  
180 185 190  
Leu Ser Gly Phe Leu Asn Pro Ser Glu Gly Trp Trp Pro Thr Met Ile  
195 200 205  
Gly Leu Ala Met Asn Asp Ser Gly Gly Tyr Asn Ala Asn Ser Met Trp  
210 215 220  
Gly Pro Ser Thr Asp Pro Ala Trp Lys Arg Asn Asp Pro Met Val Gln  
225 230 235 240  
Ile Pro Arg Leu Val Ala Asn Asn Thr Arg Ile Trp Val Tyr Cys Gly  
245 250 255  
Asn Gly Ala Pro Asn Glu Leu Gly Gly Asp Asn Ile Pro Ala Lys Phe  
260 265 270  
Leu Glu Ser Leu Thr Leu Ser Thr Asn Glu Ile Phe Gln Asn Thr Tyr  
275 280 285  
Ala Ala Ser Gly Gly Arg Asn Gly Val Phe Asn Phe Pro Pro Asn Gly  
290 295 300  
Thr His Ser Trp Pro Tyr Trp Asn Gln Gln Leu Val Ala Met Lys Pro  
305 310 315 320  
Asp Ile Gln Gln Ile Leu Asn Gly Ser Asn Asn Asn Ala  
325 330

<210> 37

<211> 340

<212> PRT

<213> Mycobacterium tuberculosis

<400> 37

Met Thr Phe Phe Glu Gln Val Arg Arg Leu Arg Ser Ala Ala Thr Thr  
1 5 10 15  
Leu Pro Arg Arg Val Ala Ile Ala Met Gly Ala Val Leu Val Tyr  
20 25 30  
Gly Leu Val Gly Thr Phe Gly Gly Pro Ala Thr Ala Gly Ala Phe Ser  
35 40 45  
Arg Pro Gly Leu Pro Val Glu Tyr Leu Gln Val Pro Ser Ala Ser Met  
50 55 60  
Gly Arg Asp Ile Lys Val Gln Phe Gln Gly Gly Gly Pro His Ala Val  
65 70 75 80  
Tyr Leu Leu Asp Gly Leu Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp  
85 90 95

Ile Asn Thr Pro Ala Phe Glu Glu Tyr Tyr Gln Ser Gly Leu Ser Val  
 100 105 110  
 Ile Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Thr Asp Trp Tyr Gln  
 115 120 125  
 Pro Ser Gln Ser Asn Gly Gln Asn Tyr Thr Tyr Lys Trp Glu Thr Phe  
 130 135 140  
 Leu Thr Arg Glu Met Pro Ala Trp Leu Gln Ala Asn Lys Gly Val Ser  
 145 150 155 160  
 Pro Thr Gly Asn Ala Ala Val Gly Leu Ser Met Ser Gly Gly Ser Ala  
 165 170 175  
 Leu Ile Leu Ala Ala Tyr Tyr Pro Gln Gln Phe Pro Tyr Ala Ala Ser  
 180 185 190  
 Leu Ser Gly Phe Leu Asn Pro Ser Glu Gly Trp Trp Pro Thr Leu Ile  
 195 200 205  
 Gly Leu Ala Met Asn Asp Ser Gly Gly Tyr Asn Ala Asn Ser Met Trp  
 210 215 220  
 Gly Pro Ser Ser Asp Pro Ala Trp Lys Arg Asn Asp Pro Met Val Gln  
 225 230 235 240  
 Ile Pro Arg Leu Val Ala Asn Asn Thr Arg Ile Trp Val Tyr Cys Gly  
 245 250 255  
 Asn Gly Thr Pro Ser Asp Leu Gly Gly Asp Asn Ile Pro Ala Lys Phe  
 260 265 270  
 Leu Glu Gly Leu Thr Leu Arg Thr Asn Gln Thr Phe Arg Asp Thr Tyr  
 275 280 285  
 Ala Ala Asp Gly Gly Arg Asn Gly Val Phe Asn Phe Pro Pro Asn Gly  
 290 295 300  
 Thr His Ser Trp Pro Tyr Trp Asn Glu Gln Leu Val Ala Met Lys Ala  
 305 310 315 320  
 Asp Ile Gln His Val Leu Asn Gly Ala Thr Pro Pro Ala Ala Pro Ala  
 325 330 335  
 Ala Pro Ala Ala  
 340

<210> 38  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Probe made in a lab

<400> 38  
 agcggctggg acatcaacac

20

<210> 39  
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 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Probe made in a lab

<400> 39  
 cagacgcggg tgttgttggc

20

<210> 40  
 <211> 1211

<212> DNA

<213> Mycobacterium vaccae

<400> 40

|            |            |            |            |             |            |      |
|------------|------------|------------|------------|-------------|------------|------|
| ggtaccggaa | gctggaggat | tgacggatat | agacttcttg | acaggattcg  | tgggccttgg | 60   |
| gcacgccgtt | tcggcgctcg | ggctgtcgcg | acagcgatga | tgcctgcttt  | ggtgggcctg | 120  |
| gctggagggt | cggcgaccgc | cggagcattc | tcccggccag | gtctgccggt  | ggagtacctg | 180  |
| atggtgcctt | cgccgtcgat | ggggcgcgac | atcaagatcc | agttccagag  | cggtagcgag | 240  |
| aactcgccgg | ctctctacct | gctcgacggc | ctgctgctgc | aggaggactt  | caacggctgg | 300  |
| gacatcaaca | ctcaggcttt | cgagtgggtt | ctcgacagcg | gcatctccgt  | ggtgatgccg | 360  |
| gtcggtagcc | agtccagctt | ctacaccgac | tggtagcccc | ccgcccgtaa  | caagggcccc | 420  |
| accgtgacct | acaagtggga | gaccttccct | acccaggagc | tcccgggctg  | gctgcaggcc | 480  |
| aaccgcgcgg | tcaagccgac | cggcagcggc | cctgtcggtc | tgtcgatggc  | gggttcggcc | 540  |
| gcgctgaacc | tggcgacctg | gcacccggag | cagttcatct | acgcgggctc  | gatgtccggc | 600  |
| ttcctgaacc | cctccgaggg | ctggtggcgg | ttcctgatca | acatctcgat  | gggtgacgcc | 660  |
| ggcggcttca | aggccgacga | catgtggggc | aagaccgagg | ggatcccaac  | agcggttgga | 720  |
| cagcgcaacg | atccgatgct | gaacatcccc | accctggctg | ccaacaacac  | ccgtatctgg | 780  |
| gtctactcgg | gtaacggcca | gcccaccgag | ctcggcgctg | gcgacctgcc  | cgccacgttc | 840  |
| ctcgaaggtc | tgaccatccg | caccaacgag | accttccgcg | acaactacat  | cgccgcgggt | 900  |
| ggccacaacg | gtgtgttcaa | cttcccggcc | aacggcacgc | acaactgggc  | gtactggggg | 960  |
| cgcgagctgc | aggcgatgaa | gcctgacctg | caggcgccac | ttctctgacg  | gttgacgaa  | 1020 |
| acgaagcccc | cggccgattg | cggccgaggg | tttcgtcgtc | cggggctact  | gtggccgaca | 1080 |
| taaccgaaat | caacgcgatg | gtggctcatc | aggaacgccg | aggggggtcat | tgcgctacga | 1140 |
| cacgaggtgg | gcgagcaatc | cttctgcccc | gacggagagg | tcaacatcca  | cgtcgagtac | 1200 |
| tccagctga  | a          |            |            |             |            | 1211 |

<210> 41

<211> 485

<212> DNA

<213> Mycobacterium vaccae

<400> 41

|            |             |            |            |            |            |     |
|------------|-------------|------------|------------|------------|------------|-----|
| agcggctggg | acatcaaacac | cgccgccttc | gagtggtagc | tcgactcggg | tctcgcgggt | 60  |
| atcatgcccg | tcggcgggca  | gtccagcttc | tacagcgact | ggtacagccc | ggcctgcggg | 120 |
| aaggccgggt | gccagacctt  | caagtgggag | acgttccctg | cccaggagct | gccggcctac | 180 |
| ctcgcgcgca | acaagggggg  | cgacccgaac | cgcacgcggg | ccgtcgggtc | gtccatggcc | 240 |
| ggttcggcgg | cgtgacgct   | ggcgatctac | cacccgcagc | agttccagta | cgccgggtcg | 300 |
| gtgtcggggt | acctgaaccc  | gtccgagggg | tggtagggca | tgctgatcaa | catctcgatg | 360 |
| ggtgacgcgg | gcggctacaa  | ggccaacgac | atgtggggtc | caccgaagga | cccagagcgc | 420 |
| gcctggaagc | gcaacgaccc  | gatggtcaac | atcggcaagc | tggtaggcaa | caacaccccc | 480 |
| ctctc      |             |            |            |            |            | 485 |

<210> 42

<211> 1052

<212> DNA

<213> Mycobacterium vaccae

<400> 42

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| ggtgatgaga | aaggtggggt | gtttgccgtt | atgaagttca | cagagaagtg | gcggggctcc | 60  |
| gcaaaggcgg | cgatgcaccg | ggtgggcgtt | gccgatatgg | ccgccgttgc | gctgcccggg | 120 |
| ctgatcgggt | tcgccggggg | ttcggcaacg | gccggggcat | tctcccggcc | cggtcttcc  | 180 |
| gtcgagtacc | tcgacgtggt | ctcgccgtcg | atgggcccgc | acatccgggt | ccagttccag | 240 |
| ggtggcggtg | ctcatgcggg | ctacctgctc | gacggtctgc | gtgcccagga | cgactacaac | 300 |
| ggctgggaca | tcaacacccc | tgcgttcgag | tggttctacg | agtccggctt | gtcgacgatc | 360 |
| atgccggctg | gcggacagtc | cagcttctac | agcgactagg | accagccgtc | tcggggcaac | 420 |
| gggcagaact | acacctacaa | gtgggagacg | ttcctgaccc | aggagctgcc | gacgtggctg | 480 |
| gaggccaacc | gcggagtgtc | gcgcaccggc | aacgcgttcg | tcggcctgtc | gatggcgggc | 540 |



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agcgcggcgc tgacctacgc gatccatcac ccgcagcagt tcctctacgc ctctgcgctg 600
tcaggcttcc tgaacccgtc cgagggtcgg tggccgatgc tgatcgggct ggcgatgaac 660
gacgcaggcg gcttcaacgc cgagagcatg tggggcccgt cctcggaccc ggcgtggaag 720
cgcaacgacc cgatggtcaa catcaaccag ctggtggcca acaacacccg gatctggatc 780
tactgcggca ccggcaccgc gtcggagctg gacaccggga ccccgggcca gaacctgatg 840
gccgcgcagt tcctcgaagg attcacgttg cggaccaaca tcgccttccg tgacaactac 900
atcgagccg gcggcaccaa cgggtgtcttc aacttcccgg cctcggggcac ccacagctgg 960
gggtactggg ggcagcagct gcagcagatg aagcccgaca tccagcgggt tctgggagct 1020
caggccaccg cctagccacc caccacacac cc 1052

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<210> 43
<211> 326
<212> PRT
<213> Mycobacterium vaccae

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<400> 43

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Met Arg Leu Leu Asp Arg Ile Arg Gly Pro Trp Ala Arg Arg Phe Gly
 1          5          10          15
Val Val Ala Val Ala Thr Ala Met Met Pro Ala Leu Val Gly Leu Ala
 20          25          30
Gly Gly Ser Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly Leu Pro Val
 35          40          45
Glu Tyr Leu Met Val Pro Ser Pro Ser Met Gly Arg Asp Ile Lys Ile
 50          55          60
Gln Phe Gln Ser Gly Gly Glu Asn Ser Pro Ala Leu Tyr Leu Leu Asp
 65          70          75          80
Gly Leu Arg Ala Gln Glu Asp Phe Asn Gly Trp Asp Ile Asn Thr Gln
 85          90          95
Ala Phe Glu Trp Phe Leu Asp Ser Gly Ile Ser Val Val Met Pro Val
 100         105         110
Gly Gly Gln Ser Ser Phe Tyr Thr Asp Trp Tyr Ala Pro Ala Arg Asn
 115         120         125
Lys Gly Pro Thr Val Thr Tyr Lys Trp Glu Thr Phe Leu Thr Gln Glu
 130         135         140
Leu Pro Gly Trp Leu Gln Ala Asn Arg Ala Val Lys Pro Thr Gly Ser
 145         150         155         160
Gly Pro Val Gly Leu Ser Met Ala Gly Ser Ala Ala Leu Asn Leu Ala
 165         170         175
Thr Trp His Pro Glu Gln Phe Ile Tyr Ala Gly Ser Met Ser Gly Phe
 180         185         190
Leu Asn Pro Ser Glu Gly Trp Trp Pro Phe Leu Ile Asn Ile Ser Met
 195         200         205
Gly Asp Ala Gly Gly Phe Lys Ala Asp Asp Met Trp Gly Lys Thr Glu
 210         215         220
Gly Ile Pro Thr Ala Val Gly Gln Arg Asn Asp Pro Met Leu Asn Ile
 225         230         235         240
Pro Thr Leu Val Ala Asn Asn Thr Arg Ile Trp Val Tyr Cys Gly Asn
 245         250         255
Gly Gln Pro Thr Glu Leu Gly Gly Gly Asp Leu Pro Ala Thr Phe Leu
 260         265         270
Glu Gly Leu Thr Ile Arg Thr Asn Glu Thr Phe Arg Asp Asn Tyr Ile
 275         280         285
Ala Ala Gly Gly His Asn Gly Val Phe Asn Phe Pro Ala Asn Gly Thr
 290         295         300
His Asn Trp Ala Tyr Trp Gly Arg Glu Leu Gln Ala Met Lys Pro Asp
 305         310         315         320
Leu Gln Ala His Leu Leu

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<210> 44  
 <211> 161  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 44  
 Ser Gly Trp Asp Ile Asn Thr Ala Ala Phe Glu Trp Tyr Val Asp Ser  
 1 5 10 15  
 Gly Leu Ala Val Ile Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser  
 20 25 30  
 Asp Trp Tyr Ser Pro Ala Cys Gly Lys Ala Gly Cys Gln Thr Tyr Lys  
 35 40 45  
 Trp Glu Thr Phe Leu Thr Gln Glu Leu Pro Ala Tyr Leu Ala Ala Asn  
 50 55 60  
 Lys Gly Val Asp Pro Asn Arg Asn Ala Ala Val Gly Leu Ser Met Ala  
 65 70 75 80  
 Gly Ser Ala Ala Leu Thr Leu Ala Ile Tyr His Pro Gln Gln Phe Gln  
 85 90 95  
 Tyr Ala Gly Ser Leu Ser Gly Tyr Leu Asn Pro Ser Glu Gly Trp Trp  
 100 105 110  
 Pro Met Leu Ile Asn Ile Ser Met Gly Asp Ala Gly Gly Tyr Lys Ala  
 115 120 125  
 Asn Asp Met Trp Gly Pro Pro Lys Asp Pro Ser Ser Ala Trp Lys Arg  
 130 135 140  
 Asn Asp Pro Met Val Asn Ile Gly Lys Leu Val Ala Asn Asn Thr Pro  
 145 150 155 160  
 Leu

<210> 45  
 <211> 334  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 45  
 Met Lys Phe Thr Glu Lys Trp Arg Gly Ser Ala Lys Ala Ala Met His  
 1 5 10 15  
 Arg Val Gly Val Ala Asp Met Ala Ala Val Ala Leu Pro Gly Leu Ile  
 20 25 30  
 Gly Phe Ala Gly Gly Ser Ala Thr Ala Gly Ala Phe Ser Arg Pro Gly  
 35 40 45  
 Leu Pro Val Glu Tyr Leu Asp Val Phe Ser Pro Ser Met Gly Arg Asp  
 50 55 60  
 Ile Arg Val Gln Phe Gln Gly Gly Gly Thr His Ala Val Tyr Leu Leu  
 65 70 75 80  
 Asp Gly Leu Arg Ala Gln Asp Asp Tyr Asn Gly Trp Asp Ile Asn Thr  
 85 90 95  
 Pro Ala Phe Glu Trp Phe Tyr Glu Ser Gly Leu Ser Thr Ile Met Pro  
 100 105 110  
 Val Gly Gly Gln Ser Ser Phe Tyr Ser Asp Trp Tyr Gln Pro Ser Arg  
 115 120 125  
 Gly Asn Gly Gln Asn Tyr Thr Tyr Lys Trp Glu Thr Phe Leu Thr Gln  
 130 135 140  
 Glu Leu Pro Thr Trp Leu Glu Ala Asn Arg Gly Val Ser Arg Thr Gly  
 145 150 155 160

Asn Ala Phe Val Gly Leu Ser Met Ala Gly Ser Ala Ala Leu Thr Tyr  
                   165                  170                  175  
 Ala Ile His His Pro Gln Gln Phe Ile Tyr Ala Ser Ser Leu Ser Gly  
                   180                  185                  190  
 Phe Leu Asn Pro Ser Glu Gly Trp Trp Pro Met Leu Ile Gly Leu Ala  
                   195                  200                  205  
 Met Asn Asp Ala Gly Gly Phe Asn Ala Glu Ser Met Trp Gly Pro Ser  
                   210                  215                  220  
 Ser Asp Pro Ala Trp Lys Arg Asn Asp Pro Met Val Asn Ile Asn Gln  
                   225                  230                  235                  240  
 Leu Val Ala Asn Asn Thr Arg Ile Trp Ile Tyr Cys Gly Thr Gly Thr  
                   245                  250                  255  
 Pro Ser Glu Leu Asp Thr Gly Thr Pro Gly Gln Asn Leu Met Ala Ala  
                   260                  265                  270  
 Gln Phe Leu Glu Gly Phe Thr Leu Arg Thr Asn Ile Ala Phe Arg Asp  
                   275                  280                  285  
 Asn Tyr Ile Ala Ala Gly Gly Thr Asn Gly Val Phe Asn Phe Pro Ala  
                   290                  295                  300  
 Ser Gly Thr His Ser Trp Gly Tyr Trp Gly Gln Gln Leu Gln Gln Met  
                   305                  310                  315                  320  
 Lys Pro Asp Ile Gln Arg Val Leu Gly Ala Gln Ala Thr Ala  
                   325                  330

<210> 46  
 <211> 795  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 46

|            |             |             |             |             |            |     |
|------------|-------------|-------------|-------------|-------------|------------|-----|
| ctgccgcggg | tttgccatct  | cttgggtcct  | gggtcgggag  | gccatgttct  | gggtaacgat | 60  |
| ccggtaccgt | ccggcgatgt  | gaccaacatg  | cgaacagcga  | caacgaagct  | aggagcggcg | 120 |
| ctcggcgag  | cagcattggt  | ggccgccacg  | gggatgggtca | gcgcggcgac  | ggcgaacgcc | 180 |
| caggaagggc | accagggtccg | ttacacgctc  | acctcgggcg  | gcgcttacga  | gttcgacctg | 240 |
| ttctatctga | cgacgcagcc  | gccgagcatg  | caggcggttca | acgccgacgc  | gtatgcgttc | 300 |
| gccaagcggg | agaagggtcag | cctcgccccg  | gggtgtgccgt | gggtcttcga  | aaccacgatg | 360 |
| gccgacccga | actgggcgat  | ccttcagggtc | agcagcacca  | cccgcgggtgg | gcaggccgcc | 420 |
| ccgaacgcgc | actgcgacat  | cgccgtcgat  | ggccaggagg  | tgctcagcca  | gcacgacgac | 480 |
| ccctacaacg | tgcggtgccca | gctcggtcag  | tggtgagtca  | cctcgccgag  | agtccggcca | 540 |
| gcgcggcg   | cagcggtctcg | cggtgcagca  | ccccgaggcg  | ctgggtcgcg  | cgggtcagcg | 600 |
| cgacgtaaag | atcgctggcc  | ccgcgcggcc  | cctcggcgag  | gatctgctcc  | gggtagacca | 660 |
| ccagcacggc | gtctaactcc  | agacccttgg  | tctgcgtggg  | tgccaccgcg  | cccgggacac | 720 |
| cgggcggggc | gatcaccacg  | ctggtgccct  | cccgggtccgc | ctccgcacgc  | acgaaatcgt | 780 |
| cgatggcaac | ggcga       |             |             |             |            | 795 |

<210> 47  
 <211> 142  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 47

Met Arg Thr Ala Thr Lys Leu Gly Ala Ala Leu Gly Ala Ala Ala  
   1                  5                  10                  15  
 Leu Val Ala Ala Thr Gly Met Val Ser Ala Ala Thr Ala Asn Ala Gln  
                   20                  25                  30  
 Glu Gly His Gln Val Arg Tyr Thr Leu Thr Ser Ala Gly Ala Tyr Glu  
                   35                  40                  45  
 Phe Asp Leu Phe Tyr Leu Thr Thr Gln Pro Pro Ser Met Gln Ala Phe

|   |     |     |
|---|-----|-----|
| 50  | 55  | 60  |
| Asn Ala Asp Ala Tyr Ala Phe Ala Lys Arg Glu Lys Val Ser Leu Ala |     |     |
| 65  | 70  | 75  |
| Pro Gly Val Pro Trp Val Phe Glu Thr Thr Met Ala Asp Pro Asn Trp |     |     |
|   | 85  | 90  |
| Ala Ile Leu Gln Val Ser Ser Thr Thr Arg Gly Gly Gln Ala Ala Pro |     |     |
|   | 100 | 105 |
| Asn Ala His Cys Asp Ile Ala Val Asp Gly Gln Glu Val Leu Ser Gln |     |     |
|   | 115 | 120 |
| His Asp Asp Pro Tyr Asn Val Arg Cys Gln Leu Gly Gln Trp         |     |     |
|   | 130 | 140 |

<210> 48  
 <211> 300  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 48  
 gccagtgcgc caacgggtttt catcgatgcc gcacacaacc ccggtggggc ctgcgcttgc 60  
 cgaaggctgc gcgacgagtt cgacttccgg tatctcgtcg gcgtcgtctc ggtgatgggg 120  
 gacaaggacg tggacgggat ccgccaggac ccgggcggtgc cggacggggc cggctctcgca 180  
 ctgttcgtct cgggcgacaa ccttcgaaag ggtgcggcgc tcaacacgat ccagatcgcc 240  
 gagctgctgg ccgcccagtt gtaagtgttc cgccgaaatt gcattccacg ccgataatcg 300

<210> 49  
 <211> 563  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 49  
 ggatcctcgg ccggtctcaag agtccgcgcc gaggtggatg tgacgctgga cggctacgag 60  
 ttcagtcggg cctgcgaggc gctgtaccac ttcgcctggg acgagttctg cgactgggat 120  
 gtcgagcttg ccaaagtgca actgggtgaa ggtttctcgc acaccacggc cgtgttggcc 180  
 accgtgctcg atgtgctgct caagcttctg caccgggtca tgccgttcgt caccgaggtg 240  
 ctgtggaagg ccctgaccgg gcgggcccgc gcgagcgaaac gtctgggaaa tgtggagtca 300  
 ctggtcgtcg cggactggcc caccggcacc ggatacgcgc tggatcaggc tgccgcacaa 360  
 cggatcgccg acacccagaa gttgatcacc gaggtgcgcc ggttccgcag cgatcagggt 420  
 ctggccgacc gccagcgggt gcctgcccgg ttgtccggca tcgacaccgc gggctctggac 480  
 gccatgtcc cggcgggtgc cgcgctggcc tggtttgacc gaggtgatg agggcttcac 540  
 cgcgtccgaa tcggtcgagg tgc 563

<210> 50  
 <211> 434  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 50  
 gggccggggc cgaggatgag caagttcgaa gtcgtcaccg ggatggcggt cgcggtttc 60  
 gccgacgcgc ccatcgacgt cgcgctcgtc gaggtcgggc tcggtgggtc ctgggacgcg 120  
 acgaacgtgg tgaacgcacc ggtcgcgggtc atcaccgccg tcgggggtga ccacaccgac 180  
 tacctcgggtg acacgatcgc cgagatcgcc ggggagaagg ccggaatca tcaccgccca 240  
 gccgacgacc tgggtgccgac cgacaccgtc gccgtgctgg cgcggcaggc tcccagggcc 300  
 atggaggtgc tgctggccca ggcgggtgcgc tcggatgcgg ctgtagcgcg cgaggattcg 360  
 gagtgcgcgg tgctggggcg tcaggtcgcc atcggcggca gctgctccgg ttgcaggggc 420  
 tcggtggcgt ctac 434

<210> 51

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<210> 52
<211> 87
<212> PRT
<213> Mycobacterium vaccae
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<210> 53
<211> 175
<212> PRT
<213> Mycobacterium vaccae
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21

Gln Arg Val Pro Ala Arg Leu Ser Gly Ile Asp Thr Ala Gly Leu Asp  
 145 150 155 160  
 Ala His Val Pro Ala Val Arg Ala Leu Ala Trp Leu Asp Arg Gly  
 165 170 175

<210> 54  
 <211> 144  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 54  
 Gly Pro Gly Pro Arg Asn Ser Lys Phe Glu Val Val Thr Gly Met Ala  
 1 5 10 15  
 Phe Ala Ala Phe Ala Asp Ala Pro Ile Asp Val Ala Val Val Glu Val  
 20 25 30  
 Gly Leu Gly Gly Arg Trp Asp Ala Thr Asn Val Val Asn Ala Pro Val  
 35 40 45  
 Ala Val Ile Thr Pro Ile Gly Val Asp His Thr Asp Tyr Leu Gly Asp  
 50 55 60  
 Thr Ile Ala Glu Ile Ala Gly Glu Lys Ala Gly Asn His His Pro Pro  
 65 70 75 80  
 Ala Asp Asp Leu Val Pro Thr Asp Thr Val Ala Val Leu Ala Arg Gln  
 85 90 95  
 Val Pro Glu Ala Asn Glu Val Leu Leu Ala Gln Ala Val Arg Ser Asp  
 100 105 110  
 Ala Ala Val Ala Arg Glu Asp Ser Glu Cys Ala Val Leu Gly Arg Gln  
 115 120 125  
 Val Ala Ile Gly Gly Ser Cys Ser Gly Cys Arg Gly Ser Val Ala Ser  
 130 135 140

<210> 55  
 <211> 145  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 55  
 Asp Pro Thr Pro Ala Pro Ala Ala Ser Trp Tyr Gly His Ser Ser  
 1 5 10 15  
 Val Leu Ile Glu Val Asp Gly Tyr Arg Val Leu Ala Asp Pro Val Trp  
 20 25 30  
 Ser Asn Arg Cys Ser Pro Ser Arg Ala Val Gly Pro Gln Arg Met His  
 35 40 45  
 Asp Val Pro Val Pro Leu Glu Ala Leu Pro Ala Val Asp Ala Val Val  
 50 55 60  
 Ile Ser Asn Asp His Tyr Asp His Leu Asp Ile Asp Thr Ile Val Ala  
 65 70 75 80  
 Leu Ala His Thr Gln Arg Ala Pro Phe Val Val Pro Leu Gly Ile Gly  
 85 90 95  
 Ala His Leu Arg Lys Trp Gly Val Pro Glu Ala Arg Ile Val Glu Leu  
 100 105 110  
 Asp Trp His Glu Ala His Arg Ile Asp Asp Leu Thr Leu Val Cys Thr  
 115 120 125  
 Pro Ala Arg His Phe Ser Gly Arg Leu Phe Ser Arg Asp Ser Thr Leu  
 130 135 140  
 Trp  
 145

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<210> 56  
<211> 10  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (1)...(1)  
<223> Residue can be either Gly, Ile, Leu or Val

<221> UNSURE  
<222> (2)...(2)  
<223> Residue can be either Ile, Leu, Gly, or Ala

<221> UNSURE  
<222> (5)...(5)

<221> UNSURE  
<222> (9)...(9)

<400> 56  
Xaa Xaa Ala Pro Xaa Gly Asp Ala Xaa Arg  
1 5 10

<210> 57  
<211> 8  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (7)...(7)  
<223> Residue can be either Ile or Leu

<400> 57  
Pro Glu Ala Glu Ala Asn Xaa Arg  
1 5

<210> 58  
<211> 11  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (4)...(4)  
<223> Residue can be either Gln or Gly

<221> UNSURE  
<222> (5)...(5)  
<223> Residue can be either Gly or Gln

<400> 58  
Thr Ala Asn Xaa Xaa Glu Tyr Tyr Asp Asn Arg  
1 5 10

<210> 59

<211> 34  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 59  
 Asn Ser Pro Arg Ala Glu Ala Glu Ala Asn Leu Arg Gly Tyr Phe Thr  
 1 5 10 15  
 Ala Asn Pro Ala Glu Tyr Tyr Asp Leu Arg Gly Ile Leu Ala Pro Ile  
 20 25 30  
 Gly Asp

<210> 60  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 60  
 ccggtggggc cgggctgcgc 20

<210> 61  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 61  
 tggccggcca ccacgtggta 20

<210> 62  
 <211> 313  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 62  
 gccggtgggc cgggctgcg cggaatacgc ggcagccaat cccactgggc cggcctcggt 60  
 gcaggaatg tcgcaggacc cggtcgcggt ggcggcctcg aacaatccgg agttgacaac 120  
 gctgtacggc tgcactgtcg ggccagctca atccgcaagt aaacctgggtg gacaccctca 180  
 acagcgggtca gtacacgggtg ttcgcaccga ccaacgcggc atttagcaag ctgccggcat 240  
 ccacgatcga cgagctcaag accaattcgt cactgctgac cagcatcctg acctaccacg 300  
 tgggtggccgg cca 313

<210> 63  
 <211> 18  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (7)...(17)

<400> 63

208710-4975001



Glu Pro Ala Gly Pro Leu Pro Xaa Tyr Asn Glu Arg Leu His Thr Leu  
 1 5 10 15  
 Xaa Gln

<210> 64  
 <211> 25  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (21)...(21)

<400> 64  
 Gly Leu Asp Asn Glu Leu Ser Leu Val Asp Gly Gln Gly Arg Thr Leu  
 1 5 10 15  
 Thr Val Gln Gln Xaa Asp Thr Phe Leu  
 20 25

<210> 65  
 <211> 26  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (3)...(3)

<221> UNSURE  
 <222> (21)...(22)

<221> UNSURE  
 <222> (24)...(24)

<400> 65  
 Asp Pro Xaa Pro Asp Ile Glu Val Glu Phe Ala Arg Gly Thr Gly Ala  
 1 5 10 15  
 Glu Pro Gly Leu Xaa Xaa Val Xaa Asp Ala  
 20 25

<210> 66  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 66  
 accgccctcg agttctcccg gccaggtctg cc

32

<210> 67  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

10051643.01400

<220>

<223> Made in a lab

<400> 67

aagcacgagc tcagtctctt ccacgcggac gt

32

<210> 68

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 68

catggatcca ttctcccggc ccggtcttcc

30

<210> 69

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 69

tttgaattct aggcggtggc ctgagc

26

<210> 70

<211> 161

<212> PRT

<213> Mycobacterium vaccae

<400> 70

Ser Gly Trp Asp Ile Asn Thr Ala Ala Phe Glu Trp Tyr Val Asp Ser  
 1 5 10 15  
 Gly Leu Ala Val Ile Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser  
 20 25 30  
 Asp Trp Tyr Ser Pro Ala Cys Gly Lys Ala Gly Cys Gln Thr Tyr Lys  
 35 40 45  
 Trp Glu Thr Phe Leu Thr Gln Glu Leu Pro Ala Tyr Leu Ala Ala Asn  
 50 55 60  
 Lys Gly Val Asp Pro Asn Arg Asn Ala Ala Val Gly Leu Ser Met Ala  
 65 70 75 80  
 Gly Ser Ala Ala Leu Thr Leu Ala Ile Tyr His Pro Gln Gln Phe Gln  
 85 90 95  
 Tyr Ala Gly Ser Leu Ser Gly Tyr Leu Asn Pro Ser Glu Gly Trp Trp  
 100 105 110  
 Pro Met Leu Ile Asn Ile Ser Met Gly Asp Ala Gly Gly Tyr Lys Ala  
 115 120 125  
 Asn Asp Met Trp Gly Arg Thr Glu Asp Pro Ser Ser Ala Trp Lys Arg  
 130 135 140  
 Asn Asp Pro Met Val Asn Ile Gly Lys Leu Val Ala Asn Asn Thr Pro  
 145 150 155 160  
 Leu

<210> 71  
 <211> 33  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 71  
 gagagactcg agaacgcca ggaagggcac cag 33

<210> 72  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 72  
 gagagactcg agtgactcac cactgaccga gc 32

<210> 73  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<221> unsure  
 <222> (3)...(3)

<221> unsure  
 <222> (6)...(6)

<221> unsure  
 <222> (9)...(9)

<221> unsure  
 <222> (15)...(15)

<400> 73  
 ggngcngcnc argcngarcc 20

<210> 74  
 <211> 825  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 74  
 ttggatccca ctcccgcgcc ggcggcggcc agctggtacg gccattccag cgtgctgatc 60  
 gaggtcgacg gctaccgcgt gctggccgac ccggtgtgga gcaacagatg ttcgccctca 120  
 cgggcggtcg gaccgcagcg catgcacgac gtcccgggtgc cgctggaggc gcttcccgcc 180  
 gtggacgcgc tgggtgatcg ccacgaccac tacgaccacc tcgacatcga caccatcgtc 240  
 gcgttggcgc acacccagcg ggccccgttc gtggtgccgt tgggcatcgg cgcacacctg 300  
 cgcaagtggg gcgtccccga ggcgcggatc gtcgagttgg actggcacga agcccaccgc 360

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| atagacgacc | tgacgtggt  | ctgcaccccc | gcccggcact | tctccggacg | gttgttctcc | 420 |
| cgcgactcga | cgctgtgggc | gtcgtgggtg | gtcaccggct | cgtcgcacaa | ggcgttcttc | 480 |
| ggtggcgaca | ccgatacac  | gaagagcttc | gccgagatcg | gcgacgagta | cggtccgttc | 540 |
| gatctgacct | tgctgccgat | cggggcctac | catcccgcgt | tcgccgacat | ccacatgaac | 600 |
| cccaggagg  | cggtgcgcgc | ccatctggac | ctgaccgagg | tggacaacag | cctgatggtg | 660 |
| cccatccact | gggcgacatt | ccgcctcgcc | ccgcatccgt | ggtccgagcc | cgccgaacgc | 720 |
| ctgctgaccg | ctgccgacgc | cgagcgggta | cgcctgaccg | tgccgattcc | cggtcagcgg | 780 |
| gtggacccgg | agtcgacggt | cgacccgtgg | tggcggttct | gaacc      |            | 825 |

<210> 75  
 <211> 273  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 75

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Asp | Pro | Thr | Pro | Ala | Pro | Ala | Ala | Ala | Ser | Trp | Tyr | Gly | His | Ser |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Val | Leu | Ile | Glu | Val | Asp | Gly | Tyr | Arg | Val | Leu | Ala | Asp | Pro | Val |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Trp | Ser | Asn | Arg | Cys | Ser | Pro | Ser | Arg | Ala | Val | Gly | Pro | Gln | Arg | Met |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| His | Asp | Val | Pro | Val | Pro | Leu | Glu | Ala | Leu | Pro | Ala | Val | Asp | Ala | Val |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Val | Ile | Ser | His | Asp | His | Tyr | Asp | His | Leu | Asp | Ile | Asp | Thr | Ile | Val |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Ala | Leu | Ala | His | Thr | Gln | Arg | Ala | Pro | Phe | Val | Val | Pro | Leu | Gly | Ile |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gly | Ala | His | Leu | Arg | Lys | Trp | Gly | Val | Pro | Glu | Ala | Arg | Ile | Val | Glu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Asp | Trp | His | Glu | Ala | His | Arg | Ile | Asp | Asp | Leu | Thr | Leu | Val | Cys |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr | Pro | Ala | Arg | His | Phe | Ser | Gly | Arg | Leu | Phe | Ser | Arg | Asp | Ser | Thr |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Leu | Trp | Ala | Ser | Trp | Val | Val | Thr | Gly | Ser | Ser | His | Lys | Ala | Phe | Phe |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Gly | Gly | Asp | Thr | Gly | Tyr | Thr | Lys | Ser | Phe | Ala | Glu | Ile | Gly | Asp | Glu |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Tyr | Gly | Pro | Phe | Asp | Leu | Thr | Leu | Leu | Pro | Ile | Gly | Ala | Tyr | His | Pro |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ala | Phe | Ala | Asp | Ile | His | Met | Asn | Pro | Glu | Glu | Ala | Val | Arg | Ala | His |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |
| Leu | Asp | Leu | Thr | Glu | Val | Asp | Asn | Ser | Leu | Met | Val | Pro | Ile | His | Trp |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ala | Thr | Phe | Arg | Leu | Ala | Pro | His | Pro | Trp | Ser | Glu | Pro | Ala | Glu | Arg |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Leu | Leu | Thr | Ala | Ala | Asp | Ala | Glu | Arg | Val | Arg | Leu | Thr | Val | Pro | Ile |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Pro | Gly | Gln | Arg | Val | Asp | Pro | Glu | Ser | Thr | Phe | Asp | Pro | Trp | Trp | Arg |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |
| Phe |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 76  
 <211> 10  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 76  
Ala Lys Thr Ile Ala Tyr Asp Glu Glu Ala  
1 5 10

<210> 77  
<211> 337  
<212> DNA  
<213> Mycobacterium vaccae

<400> 77  
gatccctaca tcctgctggt cagctccaag gtgtcgaccg tcaaggatct gctcccgtg 60  
ctggagaagg tcatccaggc cggcaagccg ctgctgatca tcgccgagga cgtcgagggc 120  
gaggccctgt ccacgctggt ggtcaacaag atccgcggca cttcaagtc cgtcgccgtc 180  
aaggctccgg gcttcggtga ccgccgcaag gcgatgctgc aggacatggc catcctcacc 240  
ggtggtcagg tcgtcagcga aagagtcggg ctgtccctgg agaccgccga cgtctcgctg 300  
ctgggccagg cccgcaaggc cgtcgtcacc aaggaca 337

<210> 78  
<211> 112  
<212> PRT  
<213> Mycobacterium vaccae

<400> 78  
Asp Pro Tyr Ile Leu Leu Val Ser Ser Lys Val Ser Thr Val Lys Asp  
1 5 10 15  
Leu Leu Pro Leu Leu Glu Lys Val Ile Gln Ala Gly Lys Pro Leu Leu  
20 25 30  
Ile Ile Ala Glu Asp Val Glu Gly Glu Ala Leu Ser Thr Leu Val Val  
35 40 45  
Asn Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val Lys Ala Pro Gly  
50 55 60  
Phe Gly Asp Arg Arg Lys Ala Met Leu Gln Asp Met Ala Ile Leu Thr  
65 70 75 80  
Gly Gly Gln Val Val Ser Glu Arg Val Gly Leu Ser Leu Glu Thr Ala  
85 90 95  
Asp Val Ser Leu Leu Gly Gln Ala Arg Lys Val Val Val Thr Lys Asp  
100 105 110

<210> 79  
<211> 360  
<212> DNA  
<213> Mycobacterium vaccae

<400> 79  
ccgtacgaga agatcggcgc tgagctgggtc aaagaggctc ccaagaagac cgacgacgtc 60  
gcgggacgac gcaccaccac cgccaccgtg ctgctcagg ctctgggttcg cgaaggcctg 120  
cgcaacgtcg cagccggcgc caaccgcgtc ggccctcaagc gtggcatcga gaaggctgtc 180  
gaggctgtca cccagtcgct gctgaagtcg gcccaaggagg tcgagaccaa ggagcagatt 240  
tctgccaccg cggcgatctc cgccggcgac acccagatcg gcgagctcat cgccgaggcc 300  
atggacaagg tcggcaacga ggggtgtcatc accgtcgagg agtcgaacac cttcggcctg 360

<210> 80  
<211> 120  
<212> PRT  
<213> Mycobacterium vaccae

<400> 80

10051643-011302

Pro Tyr Glu Lys Ile Gly Ala Glu Leu Val Lys Glu Val Ala Lys Lys  
 1 5 10 15  
 Thr Asp Asp Val Ala Gly Asp Gly Thr Thr Thr Ala Thr Val Leu Ala  
 20 25 30  
 Gln Ala Leu Val Arg Glu Gly Leu Arg Asn Val Ala Ala Gly Ala Asn  
 35 40 45  
 Pro Leu Gly Leu Lys Arg Gly Ile Glu Lys Ala Val Glu Ala Val Thr  
 50 55 60  
 Gln Ser Leu Leu Lys Ser Ala Lys Glu Val Glu Thr Lys Glu Gln Ile  
 65 70 75 80  
 Ser Ala Thr Ala Ala Ile Ser Ala Gly Asp Thr Gln Ile Gly Glu Leu  
 85 90 95  
 Ile Ala Glu Ala Met Asp Lys Val Gly Asn Glu Gly Val Ile Thr Val  
 100 105 110  
 Glu Glu Ser Asn Thr Phe Gly Leu  
 115 120

<210> 81  
 <211> 43  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 81  
 actgacgctg aggagcgaaa gcgtggggag cgaacaggat tag 43

<210> 82  
 <211> 43  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 82  
 cgacaaggaa cttcgctacc ttaggaccgt catagttacg ggc 43

<210> 83  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 83  
 aaaaaaaaaa aaaaaaaaaa 20

<210> 84  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab

<400> 84  
ggaaggaagc ggccgctttt tttttttttt t 31

<210> 85  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 85  
gagagagagc ccgggcatgc tscttsctst s 31

<210> 86  
<211> 238  
<212> DNA  
<213> Mycobacterium vaccae

<400> 86  
ctcgatgaac cgctcggagc gctcgacctg aagctgcgcc acgtcatgca gttcgagctc 60  
aagcgcattc agcgggaggt cgggatcacg ttcattctacg tgaccacga ccaggaagag 120  
gcgctcacga tgagtgcagg catcgcggtg atgaacgccg gcaacgtcga acagatcggc 180  
agcccgaccg agatctacga ccgtcccgcg acggtgttcg tcgccagctt catcgaat 238

<210> 87  
<211> 79  
<212> PRT  
<213> Mycobacterium vaccae

<400> 87  
Leu Asp Glu Pro Leu Gly Ala Leu Asp Leu Lys Leu Arg His Val Met  
1 5 10 15  
Gln Phe Glu Leu Lys Arg Ile Gln Arg Glu Val Gly Ile Thr Phe Ile  
20 25 30  
Tyr Val Thr His Asp Gln Glu Glu Ala Leu Thr Met Ser Asp Arg Ile  
35 40 45  
Ala Val Met Asn Ala Gly Asn Val Glu Gln Ile Gly Ser Pro Thr Glu  
50 55 60  
Ile Tyr Asp Arg Pro Ala Thr Val Phe Val Ala Ser Phe Ile Glu  
65 70 75

<210> 88  
<211> 1518  
<212> DNA  
<213> Mycobacterium vaccae

<400> 88  
cactcgccat ggggtgttaca ataccccacc agttcctcga agtaaacgaa cagaaccgtg 60  
acatccagct gagaaaatat tcacagcgac gaagcccggc cgatgcctga tgggggtccg 120  
catcagtaca gcgcgctttc ctgcgcggat tctattgtcg agtccggggg gtgacgaagg 180  
aatccattgt cgaaatgtaa attcgttgcg gaatcatttg cataggtccg tcagatccgc 240  
gaaggtttac ccacagacca cgacggctgt ccccaggag gacctgccct gaccggcaca 300  
cacatcaccg ctgcagaacc tgcagaacag acggcggtatt ccgcggcacc gcccgaaggc 360  
gcgcgggtga tcgagatcga ccatgtcacg aagcgcttcg gcgactacct ggccgtcgcg 420  
gacgcagact tctccatcgc gcccggggag ttctttctca tgctcgggcc gtccgggtgt 480

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gggaagacga ccacgttgcg catgatcgcg ggattcgaga ccccgactga aggggcgatc 540
cgctcgaag ggcgcgacgt gtcgaggacc ccaccaaca agcgcaacgt caacacgggtg 600
ttccagcact acgcgctgtt cccgcacatg acggtctggg acaacgtcgc gtacggcccg 660
cgagcaaga aactcggcaa aggcgaggtc cgcaagcgcg tcgacgagct gctggagatc 720
gtccggctga ccgaatttgc cgagcgagcg cccgcccagc tgtccggcgg gcagcagcag 780
cgggtggcgt tggcccgggc actggtgaac taccacgagc cgctgctgct cgatgaaccg 840
ctcggagcgc tcgacctgaa gctgcgccac gtcacgagct tcgagctcaa gcgcatccag 900
cgggaggtcg ggatcacgtt catctacgtg acccagcacc aggaagaggc gctcacgatg 960
agtgaccgca tcgcggtgat gaacgcggcg aacgtcgaac agatcggcag cccgaccgag 1020
atctacgacc gtcccgcgac ggtgttcgtc gccagcttca tcggacaggc caacctctgg 1080
gcgggccggg gcaccggccg ctccaaccgc gattacgtcg agatcgacgt tctcggctcg 1140
acgctgaagg cacgcccggg cgagaccacg atcgagcccg gcgggcacgc caccctgatg 1200
gtgctccgg aacgcatccg ggtcaccgcc ggctcccagg acgcgccgac cggtgacgtc 1260
gctgctgctc gtgccaccgt caccgacctg accttccaag gtccggtggt gcggctctcg 1320
ctggccgctc cggacgactc gaccgtgacg gccacgctcg gcccagagca ggatctgccc 1380
ctgctgcgcc ccggcgagca cgtgtacgtc agctgggcac cggaagcctc cctggtgctt 1440
cccggcgacg acatccccac caccgaggac ctcaagaga tgctcgacga ctcctgagtc 1500
acgcttcccg attgccga 1518

```

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<210> 89
<211> 376
<212> PRT
<213> Mycobacterium vaccae

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<400> 89
Val Ile Glu Ile Asp His Val Thr Lys Arg Phe Gly Asp Tyr Leu Ala
1 5 10 15
Val Ala Asp Ala Asp Phe Ser Ile Ala Pro Gly Glu Phe Phe Ser Met
20 25 30
Leu Gly Pro Ser Gly Cys Gly Lys Thr Thr Thr Leu Arg Met Ile Ala
35 40 45
Gly Phe Glu Thr Pro Thr Glu Gly Ala Ile Arg Leu Glu Gly Ala Asp
50 55 60
Val Ser Arg Thr Pro Pro Asn Lys Arg Asn Val Asn Thr Val Phe Gln
65 70 75 80
His Tyr Ala Leu Phe Pro His Met Thr Val Trp Asp Asn Val Ala Tyr
85 90 95
Gly Pro Arg Ser Lys Lys Leu Gly Lys Gly Glu Val Arg Lys Arg Val
100 105 110
Asp Glu Leu Leu Glu Ile Val Arg Leu Thr Glu Phe Ala Glu Arg Arg
115 120 125
Pro Ala Gln Leu Ser Gly Gly Gln Gln Gln Arg Val Ala Leu Ala Arg
130 135 140
Ala Leu Val Asn Tyr Pro Ser Ala Leu Leu Leu Asp Glu Pro Leu Gly
145 150 155 160
Ala Leu Asp Leu Lys Leu Arg His Val Met Gln Phe Glu Leu Lys Arg
165 170 175
Ile Gln Arg Glu Val Gly Ile Thr Phe Ile Tyr Val Thr His Asp Gln
180 185 190
Glu Glu Ala Leu Thr Met Ser Asp Arg Ile Ala Val Met Asn Ala Gly
195 200 205
Asn Val Glu Gln Ile Gly Ser Pro Thr Glu Ile Tyr Asp Arg Pro Ala
210 215 220
Thr Val Phe Val Ala Ser Phe Ile Gly Gln Ala Asn Leu Trp Ala Gly
225 230 235 240
Arg Cys Thr Gly Arg Ser Asn Arg Asp Tyr Val Glu Ile Asp Val Leu
245 250 255

```



Gly Ser Thr Leu Lys Ala Arg Pro Gly Glu Thr Thr Ile Glu Pro Gly  
260 265 270  
Gly His Ala Thr Leu Met Val Arg Pro Glu Arg Ile Arg Val Thr Pro  
275 280 285  
Gly Ser Gln Asp Ala Pro Thr Gly Asp Val Ala Cys Val Arg Ala Thr  
290 295 300  
Val Thr Asp Leu Thr Phe Gln Gly Pro Val Val Arg Leu Ser Leu Ala  
305 310 315 320  
Ala Pro Asp Asp Ser Thr Val Ile Ala His Val Gly Pro Glu Gln Asp  
325 330 335  
Leu Pro Leu Leu Arg Pro Gly Asp Asp Val Tyr Val Ser Trp Ala Pro  
340 345 350  
Glu Ala Ser Leu Val Leu Pro Gly Asp Asp Ile Pro Thr Thr Glu Asp  
355 360 365  
Leu Glu Glu Met Leu Asp Asp Ser  
370 375

<210> 90  
<211> 33  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 90  
gagagactcg aggtgatcga gatcgaccat gtc 33

<210> 91  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 91  
agagactcga gcaatcggga agcgtgactc a 31

<210> 92  
<211> 323  
<212> DNA  
<213> Mycobacterium vaccae

<400> 92  
gtcgactaca aagaagactt caacgacaac gagcagtggg tcgccaaagg caaggagccg 60  
ttgtcgcgca agcaggacat aggcgcgcgac ctggtgatcc ccaccgagtt catggccgcg 120  
cgcgtcaagg gcctgggatg gctcaatgag atcagcgaag ccggcgtgcc caatcgcaag 180  
aatctgcgtc aggacctgtt ggactcgagc atcgacgagg gccgcaagtt caccgcgccg 240  
tacatgaccg gcatggtcgg tctcgctac aacaaggcag ccaccggacg cgatatccgc 300  
accatcgacg acctctggga tcc 323

<210> 93  
<211> 1341  
<212> DNA  
<213> Mycobacterium vaccae

<400> 93

|             |             |             |            |             |             |      |
|-------------|-------------|-------------|------------|-------------|-------------|------|
| ccccaccccc  | ttccctggag  | ccgacgaaag  | gcacccgcac | atgtcccgtg  | acatcgatcc  | 60   |
| ccacctgctg  | gcccgaaatga | ccgcacgcgc  | caccttgctg | cgccgcttca  | tcggcggtgg  | 120  |
| cgccgcggcc  | gccgcggggc  | tgaccctcgg  | ttcgtcgttc | ctggcgggcg  | gcgggtccga  | 180  |
| cagtgggacc  | tcgagcacca  | cgtcacagga  | cagcggcccc | gccagcggcg  | ccctgcgcgt  | 240  |
| ctccaactgg  | ccgctctata  | tggccgacgg  | tttcatcgca | gcgttccaga  | ccgcctcggg  | 300  |
| catcacggtc  | gactacaaaag | aagacttcaa  | cgacaacgag | cagtgggttcg | ccaaggtcaa  | 360  |
| ggagccggtg  | tcgcgcaagc  | aggacatagg  | cgccgacctg | gtgatcccca  | ccgagttcat  | 420  |
| ggccgcgcgc  | gtcaaggggc  | tgggatggct  | caatgagatc | agcgaagccg  | gcgtgcccac  | 480  |
| tcgcaagaat  | ctgcgtcagg  | acctggttga  | ctcgagcatc | gacgagggcc  | gcaagttcac  | 540  |
| cgcgccgtac  | atgaccggca  | tggtcggtct  | cgcctacaac | aaggcagcca  | ccggacgcga  | 600  |
| tatccgcacc  | atcgacgacc  | tctgggatcc  | cgcgttcaag | ggccgcgtca  | gtctgttctc  | 660  |
| cgacgtccag  | gacggcctcg  | gcatgatcat  | gctctcgcag | ggcaactcgc  | cggagaatcc  | 720  |
| gaccaccgag  | tccattcagc  | aggcggtcga  | tctggtcgcg | gaacagaacg  | acagggggtc  | 780  |
| agatccgtcg  | cttcaccggc  | aacgactacg  | ccgacgacct | ggccgcagaa  | acatcgccat  | 840  |
| cgcgcaggcg  | tactccgggtg | acgtcgtgca  | gctgcaggcg | gacaaccccg  | atctgcagtt  | 900  |
| catcgttccc  | gaatccggcg  | gcgactgggt  | cgtcgacacg | atgggtgatcc | cgtacaccac  | 960  |
| gcagaaccag  | aaggccggcg  | aggcgtggat  | cgactacatc | tacgaccgag  | ccaactacgc  | 1020 |
| caagctgggtc | gcgttcaccc  | agttcgtgcc  | cgcactctcg | gacatgaccg  | acgaactcgc  | 1080 |
| caaggtcgat  | cctgcacatcg | cggagaaccc  | gctgatcaac | ccgtcggccg  | aggtgcaggc  | 1140 |
| gaacctgaag  | tcgtggggcg  | cactgaccga  | cgagcagacg | caggagttca  | acactgcgta  | 1200 |
| cgccgccgtc  | accggcggct  | gacgcgggtg  | tagtgccgat | gcgaggggca  | taaattggccc | 1260 |
| tgcggacgcg  | aggagcataa  | atggccgggtg | tcgccaccag | cagccgtcag  | cggacaaggt  | 1320 |
| cgctccgtat  | ctgatgggtcc | t           |            |             |             | 1341 |

<210> 94

<211> 393

<212> PRT

<213> Mycobacterium vaccae

<400> 94

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Arg | Asp | Ile | Asp | Pro | His | Leu | Leu | Ala | Arg | Met | Thr | Ala | Arg |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Arg | Thr | Leu | Arg | Arg | Arg | Phe | Ile | Gly | Gly | Ala | Ala | Ala | Ala | Ala | Ala |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Gly | Leu | Thr | Leu | Gly | Ser | Ser | Phe | Leu | Ala | Ala | Cys | Gly | Ser | Asp | Ser |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Thr | Ser | Ser | Thr | Thr | Ser | Gln | Asp | Ser | Gly | Pro | Ala | Ser | Gly | Ala |
|     |     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |
| Leu | Arg | Val | Ser | Asn | Trp | Pro | Leu | Tyr | Met | Ala | Asp | Gly | Phe | Ile | Ala |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Ala | Phe | Gln | Thr | Ala | Ser | Gly | Ile | Thr | Val | Asp | Tyr | Lys | Glu | Asp | Phe |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Asn | Asp | Asn | Glu | Gln | Trp | Phe | Ala | Lys | Val | Lys | Glu | Pro | Leu | Ser | Arg |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Lys | Gln | Asp | Ile | Gly | Ala | Asp | Leu | Val | Ile | Pro | Thr | Glu | Phe | Met | Ala |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Arg | Val | Lys | Gly | Leu | Gly | Trp | Leu | Asn | Glu | Ile | Ser | Glu | Ala | Gly |
|     |     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |
| Val | Pro | Asn | Arg | Lys | Asn | Leu | Arg | Gln | Asp | Leu | Leu | Asp | Ser | Ser | Ile |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Asp | Glu | Gly | Arg | Lys | Phe | Thr | Ala | Pro | Tyr | Met | Thr | Gly | Met | Val | Gly |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Leu | Ala | Tyr | Asn | Lys | Ala | Ala | Thr | Gly | Arg | Asp | Ile | Arg | Thr | Ile | Asp |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Asp | Leu | Trp | Asp | Pro | Ala | Phe | Lys | Gly | Arg | Val | Ser | Leu | Phe | Ser | Asp |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |

Val Gln Asp Gly Leu Gly Met Ile Met Leu Ser Gln Gly Asn Ser Pro  
 210 215 220  
 Glu Asn Pro Thr Thr Glu Ser Ile Gln Gln Ala Val Asp Leu Val Arg  
 225 230 235 240  
 Glu Gln Asn Asp Arg Gly Ser Asp Pro Ser Leu His Arg Gln Arg Leu  
 245 250 255  
 Arg Arg Arg Pro Gly Arg Arg Asn Ile Ala Ile Ala Gln Ala Tyr Ser  
 260 265 270  
 Gly Asp Val Val Gln Leu Gln Ala Asp Asn Pro Asp Leu Gln Phe Ile  
 275 280 285  
 Val Pro Glu Ser Gly Gly Asp Trp Phe Val Asp Thr Met Val Ile Pro  
 290 295 300  
 Tyr Thr Thr Gln Asn Gln Lys Ala Ala Glu Ala Trp Ile Asp Tyr Ile  
 305 310 315 320  
 Tyr Asp Arg Ala Asn Tyr Ala Lys Leu Val Ala Phe Thr Gln Phe Val  
 325 330 335  
 Pro Ala Leu Ser Asp Met Thr Asp Glu Leu Ala Lys Val Asp Pro Ala  
 340 345 350  
 Ser Ala Glu Asn Pro Leu Ile Asn Pro Ser Ala Glu Val Gln Ala Asn  
 355 360 365  
 Leu Lys Ser Trp Ala Ala Leu Thr Asp Glu Gln Thr Gln Glu Phe Asn  
 370 375 380  
 Thr Ala Tyr Ala Ala Val Thr Gly Gly  
 385 390

<210> 95  
 <211> 22  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 95  
 atgtcccgtg acatcgatcc cc 22

<210> 96  
 <211> 21  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 96  
 atcggcacta ccaccgcgtc a 21

<210> 97  
 <211> 861  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 97  
 gccggcgctc gcatatctcg cgatcttctt ccgtgggtgcc gttcttctcg ctggcacgca 60  
 cctcgttgct ggagaccggc ggctcgggtg tcatgccgac gctgacgttc gcctgggact 120  
 tcggcaacta cgtcgacgcg ttacgatgt accacgagca gatcttccgc tcgttcggct 180  
 acgcgttcgt cgccacggtg ctgtgcctgt tgctggcgct cccgctggcc tacgtcatcg 240  
 cgttcaaggc cggccgggtt aagaacctga tccctggggct ggtgatcctg ccgttcttcg 300  
 tcacgttcct gatccgcacc attgcgtgga agacgatcct ggccgacgaa ggctgggtgg 360  
 tcaccgcgtc gggcgccatc gggctgctgc ctgacgaggg cgggctgctg tccaccagct 420  
 gggcggtcat cggcggtctg acctacaact ggatcatctt catgatcctg ccgctgtacg 480  
 tcagcctgga gaagatcgac ccgcgtctgc tggaggctc ccaggacctc tactcgtcgg 540  
 cgccgcgcag cttcggcaag gtgatcctgc cgatggcgat gcccggggtg ctggccggga 600

gcatgctggt gttcatcccg gccgtcggcg acttcatcaa cgccgactat ctccggcagta 660  
cccagaccac catgatcggc aacgtgatcc agaagcagtt cctggtcgtc aaggactatc 720  
cggcggcggc cgcgctgagt ctggggctga tgttgctgat cctgatcggc gtgctcctct 780  
acacacgggc gctgggttcg gaggatctgg tatgaccacc caggcaggcg ccgcactggc 840  
caccgccgcc caggcagatc c 861

<210> 98  
<211> 259  
<212> PRT  
<213> Mycobacterium vaccae

<400> 98  
Val Val Pro Phe Phe Ser Leu Ala Arg Thr Ser Leu Ser Glu Thr Gly  
1 5 10 15  
Gly Ser Val Phe Met Pro Thr Leu Thr Phe Ala Trp Asp Phe Gly Asn  
20 25 30  
Tyr Val Asp Ala Phe Thr Met Tyr His Glu Gln Ile Phe Arg Ser Phe  
35 40 45  
Gly Tyr Ala Phe Val Ala Thr Val Leu Cys Leu Leu Leu Ala Phe Pro  
50 55 60  
Leu Ala Tyr Val Ile Ala Phe Lys Ala Gly Arg Phe Lys Asn Leu Ile  
65 70 75 80  
Leu Gly Leu Val Ile Leu Pro Phe Phe Val Thr Phe Leu Ile Arg Thr  
85 90 95  
Ile Ala Trp Thr Ile Leu Ala Asp Glu Gly Trp Val Val Thr Ala Leu  
100 105 110  
Gly Ala Ile Gly Leu Leu Pro Asp Glu Gly Arg Leu Leu Ser Thr Ser  
115 120 125  
Trp Ala Val Ile Gly Gly Leu Thr Tyr Asn Trp Ile Ile Phe Met Ile  
130 135 140  
Leu Pro Leu Tyr Val Ser Leu Glu Lys Ile Asp Pro Arg Leu Leu Glu  
145 150 155 160  
Ala Ser Gln Asp Leu Tyr Ser Ser Ala Pro Arg Ser Phe Gly Lys Val  
165 170 175  
Ile Leu Pro Met Ala Met Pro Gly Val Leu Ala Gly Ser Met Leu Val  
180 185 190  
Phe Ile Pro Ala Val Gly Asp Phe Ile Asn Ala Asp Tyr Leu Gly Ser  
195 200 205  
Thr Gln Thr Thr Met Ile Gly Asn Val Ile Gln Lys Gln Phe Leu Val  
210 215 220  
Val Lys Asp Tyr Pro Ala Ala Ala Ala Leu Ser Leu Gly Leu Met Leu  
225 230 235 240  
Leu Ile Leu Ile Gly Val Leu Leu Tyr Thr Arg Ala Leu Gly Ser Glu  
245 250 255  
Asp Leu Val

<210> 99  
<211> 277  
<212> DNA  
<213> Mycobacterium vaccae

<400> 99  
gtaatctttg ctggagcccg tacgccggta ggcaaaactca tgggttcgct caaggacttc 60  
aagggcagcg atctcgggtgc cgtggcgatc aagggcgccc tggagaaaagc cttccccggc 120  
gtcgacgacc ctgctcgtct cgtcgagtac gtgatcatgg gccaaagtgt ctccgccggc 180  
gccggccaga tgcccggccc ccaggccgcc gtcgccgccg gcatcccggtg ggacgtcgcc 240

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tcgctgacga tcaacaagat gtgcctgtcg ggcacgcg

277

<210> 100  
<211> 92  
<212> PRT  
<213> Mycobacterium vaccae

<400> 100  
Val Ile Phe Ala Gly Ala Arg Thr Pro Val Gly Lys Leu Met Gly Ser  
1 5 10 15  
Leu Lys Asp Phe Lys Gly Ser Asp Leu Gly Ala Val Ala Ile Lys Gly  
20 25 30  
Ala Leu Glu Lys Ala Phe Pro Gly Val Asp Asp Pro Ala Arg Leu Val  
35 40 45  
Glu Tyr Val Ile Met Gly Gln Val Leu Ser Ala Gly Ala Gly Gln Met  
50 55 60  
Pro Ala Arg Gln Ala Ala Val Ala Ala Gly Ile Pro Trp Asp Val Ala  
65 70 75 80  
Ser Leu Thr Ile Asn Lys Met Cys Leu Ser Gly Ile  
85 90

<210> 101  
<211> 12  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (1)...(1)  
<223> Residue can be either Glu or Pro

<221> UNSURE  
<222> (2)...(2)  
<223> Residue can be either Pro or Glu

<221> UNSURE  
<222> (7)...(7)

<221> UNSURE  
<222> (12)...(12)

<400> 101  
Xaa Xaa Ala Asp Arg Gly Xaa Ser Lys Tyr Arg Xaa  
1 5 10

<210> 102  
<211> 24  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (1)...(1)

<400> 102  
Xaa Ile Asp Glu Ser Leu Phe Asp Ala Glu Glu Lys Met Glu Lys Ala  
1 5 10 15

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Val Ser Val Ala Arg Asp Ser Ala  
20

<210> 103  
<211> 23  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (1)...(2)

<221> UNSURE  
<222> (15)...(15)

<221> UNSURE  
<222> (17)...(17)

<400> 103

Xaa Xaa Ile Ala Pro Ala Thr Ser Gly Thr Leu Ser Glu Phe Xaa Ala  
1 5 10 15  
Xaa Lys Gly Val Thr Met Glu  
20

<210> 104  
<211> 15  
<212> PRT  
<213> Mycobacterium vaccae

<400> 104

Pro Asn Val Pro Asp Ala Phe Ala Val Leu Ala Asp Arg Val Gly  
1 5 10 15

<210> 105  
<211> 9  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (1)...(1)

<400> 105

Xaa Ile Arg Val Gly Val Asn Gly Phe  
1 5

<210> 106  
<211> 485  
<212> DNA  
<213> Mycobacterium vaccae

<400> 106

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| agcggctggg | acatcaacac | cgccgccttc | gagtggtacg | tcgactcggg | tctcgcggtg | 60  |
| atcatgcccg | tcggcgggca | gtccagcttc | tacagcgact | ggtacagccc | ggcctgcggt | 120 |
| aaggccgggt | gccagacctt | caagtgggag | acgttcctga | cccaggagct | gccggcctac | 180 |
| ctcgccgcca | acaagggggg | cgacccgaac | cgcaacgcgg | ccgtcgggtc | gtccatggcc | 240 |
| ggttcggcgg | cgctgacgct | ggcgatctac | cacccgcagc | agttccagta | cgccgggtcg | 300 |

```
ctgtcgggct acctgaaccc gtccgagggg tgggtggcga tgctgatcaa catctcgatg 360
ggtgacgcgg gcggtctaaa ggccaacgac atgtggggtc gcaccgagga cccgagcagc 420
gcctggaagc gcaacgaccc gatggtcaac atcgggaagc tggtcgcaa caacaccccc 480
ctctc 485
```

```
<210> 107
<211> 501
<212> DNA
<213> Mycobacterium vaccae
```

```
<220>
<221> unsure
<222> (441)...(441)
```

```
<221> unsure
<222> (450)...(450)
```

```
<400> 107
atgccggtgc gacgtgcgcg cagtgcgctt gcgtccgtga ccttcgtcgc ggccgcgtgc 60
gtgggcgctg agggcaccgc actggcggcg acgccggact ggagcgggcg ctacacggtg 120
gtgacgttcg cctccgacaa actcggcacg agtgtggccg cccgccagcc agaaccgcac 180
ttcagcggtc agtacacctt cagcacgtcc tgtgtgggca cctgcgtggc caccgcgtcc 240
gacggcccgg cgccgtcgaa cccgacgatt ccgcagcccg cgcgctacac ctgggacggc 300
aggcagtggg tgttcaacta caactggcag tgggagtgtc tccgcggcgc cgacgtccc 360
cgcgagtacg ccgcccgcgc ttcgctgggtg ttctacgcc cgaccgccga cgggtcgatg 420
ttcggcacct ggcgaccga natcctggan ggcctctgca agggcaccgt gatcatgccg 480
gtcgcggcct atccggcgta g 501
```

```
<210> 108
<211> 180
<212> DNA
<213> Mycobacterium vaccae
```

```
<400> 108
atgaaccagc cgcggcccga ggccgagggc aacctgcggg gctacttcac cgccaacccg 60
gcggagtact acgacctgcg gggcatcctc gccccgatcg gtgacgcgca gcgcaactgc 120
aacatcaccg tgctgccggt agagctgcag acggcctacg acacgttcat ggccggctga 180
```

```
<210> 109
<211> 166
<212> PRT
<213> Mycobacterium vaccae
```

```
<400> 109
Met Pro Val Arg Arg Ala Arg Ser Ala Leu Ala Ser Val Thr Phe Val
1 5 10 15
Ala Ala Ala Cys Val Gly Ala Glu Gly Thr Ala Leu Ala Ala Thr Pro
20 25 30
Asp Trp Ser Gly Arg Tyr Thr Val Thr Phe Ala Ser Asp Lys Leu
35 40 45
Gly Thr Ser Val Ala Ala Arg Gln Pro Glu Pro Asp Phe Ser Gly Gln
50 55 60
Tyr Thr Phe Ser Thr Ser Cys Val Gly Thr Cys Val Ala Thr Ala Ser
65 70 75 80
Asp Gly Pro Ala Pro Ser Asn Pro Thr Ile Pro Gln Pro Ala Arg Tyr
85 90 95
Thr Trp Asp Gly Arg Gln Trp Val Phe Asn Tyr Asn Trp Gln Trp Glu
```

100 105 110  
 Cys Phe Arg Gly Ala Asp Val Pro Arg Glu Tyr Ala Ala Ala Arg Ser  
 115 120 125  
 Leu Val Phe Tyr Ala Pro Thr Ala Asp Gly Ser Met Phe Gly Thr Trp  
 130 135 140  
 Arg Thr Asp Ile Leu Asp Gly Leu Cys Lys Gly Thr Val Ile Met Pro  
 145 150 155 160  
 Val Ala Ala Tyr Pro Ala  
 165

<210> 110  
 <211> 74  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 110  
 Pro Arg Asp Thr His Pro Gly Ala Asn Gln Ala Val Thr Ala Ala Met  
 1 5 10 15  
 Asn Gln Pro Arg Pro Glu Ala Glu Ala Asn Leu Arg Gly Tyr Phe Thr  
 20 25 30  
 Ala Asn Pro Ala Glu Tyr Tyr Asp Leu Arg Gly Ile Leu Ala Pro Ile  
 35 40 45  
 Gly Asp Ala Gln Arg Asn Cys Asn Ile Thr Val Leu Pro Val Glu Leu  
 50 55 60  
 Gln Thr Ala Tyr Asp Thr Phe Met Ala Gly  
 65 70

<210> 111  
 <211> 503  
 <212> DNA  
 <213> Mycobacterium vaccae

<220>  
 <221> unsure  
 <222> (358)...(358)

<400> 111  
 atgcaggtgc ggctgttct gggcagtgtc ggtgcagcag tcgcggtttc ggccgcgtta 60  
 tggcagacgg gggtttcgat accgaccgcc tcagcggatc cgtgtccgga catcgaggtg 120  
 atcttcgcgc gcgggaccgg tgcggaaccc ggctcgggt gggtcggtga tgcgttcgtc 180  
 aacgcgctgc ggcccaaggt cggtgagcag tcggtgggca cctacgcggt gaactaccgc 240  
 gcaggattcg gacttcgaca aatcggcgcc catgggcgcg gccgacgcat cggggcgggt 300  
 gcagtggatg gccgacaact gcccggaacac caagcttgtc ctgggcggca tgtcgcangg 360  
 cgccggcgtc atcgacctga tcaccgtcga tccgcgaccg ctgggcccgt tcacccccac 420  
 cccgatgccg ccccgcgtcg ccgaccacgt ggccgcggtt gtggtcttcg gaaatccgtt 480  
 gcgcgacatc cgtggtggcg gtc 503

<210> 112  
 <211> 167  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (119)...(119)

<400> 112



Met Gln Val Arg Arg Val Leu Gly Ser Val Gly Ala Ala Val Ala Val  
 1 5 10 15  
 Ser Ala Ala Leu Trp Gln Thr Gly Val Ser Ile Pro Thr Ala Ser Ala  
 20 25 30  
 Asp Pro Cys Pro Asp Ile Glu Val Ile Phe Ala Arg Gly Thr Gly Ala  
 35 40 45  
 Glu Pro Gly Leu Gly Trp Val Gly Asp Ala Phe Val Asn Ala Leu Arg  
 50 55 60  
 Pro Lys Val Gly Glu Gln Ser Val Gly Thr Tyr Ala Val Asn Tyr Pro  
 65 70 75 80  
 Ala Gly Phe Asp Phe Asp Lys Ser Ala Pro Met Gly Ala Ala Asp Ala  
 85 90 95  
 Ser Gly Arg Val Gln Trp Met Ala Asp Asn Cys Pro Asp Thr Lys Leu  
 100 105 110  
 Val Leu Gly Gly Met Ser Xaa Gly Ala Gly Val Ile Asp Leu Ile Thr  
 115 120 125  
 Val Asp Pro Arg Pro Leu Gly Arg Phe Thr Pro Thr Pro Met Pro Pro  
 130 135 140  
 Arg Val Ala Asp His Val Ala Ala Val Val Val Phe Gly Asn Pro Leu  
 145 150 155 160  
 Arg Asp Ile Arg Gly Gly Gly  
 165

<210> 113

<211> 1569

<212> DNA

<213> Mycobacterium vaccae

<400> 113

|            |             |             |            |            |            |      |
|------------|-------------|-------------|------------|------------|------------|------|
| atggccaaga | caattgctga  | tgacgaagag  | gccccgcgtg | gcctcgagcg | gggcctcaac | 60   |
| gccctcgag  | acgccgtaaa  | ggtgacgttg  | ggcccgagg  | gtcgcaacgt | cgtgctggag | 120  |
| aagaagtggg | gcgccccac   | gatcaccaac  | gatggtgtgt | ccatcgccaa | ggagatcgag | 180  |
| ctggaggacc | cgtacgagaa  | gatcggcgt   | gagctggtca | aagaggctcg | caagaagacc | 240  |
| gacgacgtcg | cgggcgacgg  | caccaccacc  | gccaccgtgc | tcgtcaggc  | tctggttcgc | 300  |
| gaaggcctgc | gcaacgtcgc  | agccggcgcc  | aaccgcgtcg | gcctcaagcg | tggcatcgag | 360  |
| aaggctgtcg | aggctgtcac  | ccagtcgctg  | ctgaagtcgg | ccaaggaggt | cgagaccaag | 420  |
| gagcagattt | ctgccaccgc  | ggcgatttcc  | gcggcgaca  | cccagatcgg | cgagctcatc | 480  |
| gccgaggcca | tggacaaggt  | cggaacagag  | ggtgtcatca | ccgtcgagga | gtcgaacacc | 540  |
| ttcggcctgc | agctcgagct  | caccgagggg  | atgcgttcg  | acaagggcta | catctcgggt | 600  |
| tacttcgtga | ccgacgccga  | gcgccaggaa  | gccgtcctgg | aggatcccta | catcctgctg | 660  |
| gtcagctcca | aggtgtcgac  | cgtcaaggat  | ctgctccgcg | tgctggagaa | ggtcatccag | 720  |
| gccggcaagc | cgctgctgat  | catcgccgag  | gacgtcgagg | gagaggccct | gtccacgctg | 780  |
| gtggtcaaca | agatccgcgg  | caccttcaag  | tccgtcgccg | tcaaggctcc | gggcttcggg | 840  |
| gaccgcccga | aggcgatgct  | gcaggacatg  | gccatcctca | ccggtggtca | ggtcgtcagc | 900  |
| gaaagagtcg | ggctgtccct  | ggagaccgcc  | gacgtctcgc | tgctgggcca | ggcccgaag  | 960  |
| gtcgtcgtca | ccaaggacga  | gaccaccatc  | gtcgaggggt | cgggcgattc | cgatgccatc | 1020 |
| gccggccggg | tggctcagat  | ccgcgccgag  | atcgagaaca | gcgactccga | ctacgaccgc | 1080 |
| gagaagctgc | aggagcgcct  | ggccaagctg  | gccggcggtg | ttgcggtgat | caaggccgga | 1140 |
| gctgccaccg | aggtggagct  | caaggagcgc  | aagcaccgca | tcgaggacgc | cgtccgcaac | 1200 |
| gcgaaggctg | ccgtcgaaga  | gggcatcgtc  | gccggtggcg | gcgtggctct | gctgcagtcg | 1260 |
| gctcctgcgc | tggacgacct  | cggcctgacg  | ggcgacgagg | ccaccggtgc | caacatcgtc | 1320 |
| cgctgggcgc | tgctggctcc  | gctcaagcag  | atcgcttca  | acggcgccct | ggagcccggc | 1380 |
| gtcgttgccg | agaaggtgtc  | caacctgccc  | gcgggtcacg | gcctcaacgc | cgcgaccggt | 1440 |
| gagtacgagg | acctgtctaa  | ggccggcgct  | gccgaccggg | tgaaggtcac | ccgctcggcg | 1500 |
| ctgcagaacg | cggcgctccat | cgcggtctctg | ttcctcacca | ccgaggccgt | cgtcgccgac | 1560 |
| aagccggag  |             |             |            |            |            | 1569 |

<210> 114  
 <211> 523  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 114

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Lys | Thr | Ile | Ala | Tyr | Asp | Glu | Glu | Ala | Arg | Arg | Gly | Leu | Glu |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Arg | Gly | Leu | Asn | Ala | Leu | Ala | Asp | Ala | Val | Lys | Val | Thr | Leu | Gly | Pro |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |     |     |
| Lys | Gly | Arg | Asn | Val | Val | Leu | Glu | Lys | Lys | Trp | Gly | Ala | Pro | Thr | Ile |
|     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| Thr | Asn | Asp | Gly | Val | Ser | Ile | Ala | Lys | Glu | Ile | Glu | Leu | Glu | Asp | Pro |
|     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |
| Tyr | Glu | Lys | Ile | Gly | Ala | Glu | Leu | Val | Lys | Glu | Val | Ala | Lys | Lys | Thr |
| 65  |     |     | 70  |     |     |     |     |     | 75  |     |     |     |     |     | 80  |
| Asp | Asp | Val | Ala | Gly | Asp | Gly | Thr | Thr | Thr | Ala | Thr | Val | Leu | Ala | Gln |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |
| Ala | Leu | Val | Arg | Glu | Gly | Leu | Arg | Asn | Val | Ala | Ala | Gly | Ala | Asn | Pro |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Gly | Leu | Lys | Arg | Gly | Ile | Glu | Lys | Ala | Val | Glu | Ala | Val | Thr | Gln |
|     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |
| Ser | Leu | Leu | Lys | Ser | Ala | Lys | Glu | Val | Glu | Thr | Lys | Glu | Gln | Ile | Ser |
|     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |
| Ala | Thr | Ala | Ala | Ile | Ser | Ala | Gly | Asp | Thr | Gln | Ile | Gly | Glu | Leu | Ile |
| 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     |     | 160 |
| Ala | Glu | Ala | Met | Asp | Lys | Val | Gly | Asn | Glu | Gly | Val | Ile | Thr | Val | Glu |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |     |
| Glu | Ser | Asn | Thr | Phe | Gly | Leu | Gln | Leu | Glu | Leu | Thr | Glu | Gly | Met | Arg |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |
| Phe | Asp | Lys | Gly | Tyr | Ile | Ser | Gly | Tyr | Phe | Val | Thr | Asp | Ala | Glu | Arg |
|     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |
| Gln | Glu | Ala | Val | Leu | Glu | Asp | Pro | Tyr | Ile | Leu | Leu | Val | Ser | Ser | Lys |
|     | 210 |     |     |     |     | 215 |     |     |     | 220 |     |     |     |     |     |
| Val | Ser | Thr | Val | Lys | Asp | Leu | Leu | Pro | Leu | Leu | Glu | Lys | Val | Ile | Gln |
| 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     |     | 240 |
| Ala | Gly | Lys | Pro | Leu | Leu | Ile | Ile | Ala | Glu | Asp | Val | Glu | Gly | Glu | Ala |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |
| Leu | Ser | Thr | Leu | Val | Val | Asn | Lys | Ile | Arg | Gly | Thr | Phe | Lys | Ser | Val |
|     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |
| Ala | Val | Lys | Ala | Pro | Gly | Phe | Gly | Asp | Arg | Arg | Lys | Ala | Met | Leu | Gln |
|     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |
| Asp | Met | Ala | Ile | Leu | Thr | Gly | Gly | Gln | Val | Val | Ser | Glu | Arg | Val | Gly |
|     | 290 |     |     |     | 295 |     |     | 300 |     |     |     |     |     |     |     |
| Leu | Ser | Leu | Glu | Thr | Ala | Asp | Val | Ser | Leu | Leu | Gly | Gln | Ala | Arg | Lys |
| 305 |     |     |     |     | 310 |     |     | 315 |     |     |     |     |     |     | 320 |
| Val | Val | Val | Thr | Lys | Asp | Glu | Thr | Thr | Ile | Val | Glu | Gly | Ser | Gly | Asp |
|     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |     |
| Ser | Asp | Ala | Ile | Ala | Gly | Arg | Val | Ala | Gln | Ile | Arg | Ala | Glu | Ile | Glu |
|     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |     |
| Asn | Ser | Asp | Ser | Asp | Tyr | Asp | Arg | Glu | Lys | Leu | Gln | Glu | Arg | Leu | Ala |
|     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |     |
| Lys | Leu | Ala | Gly | Gly | Val | Ala | Val | Ile | Lys | Ala | Gly | Ala | Ala | Thr | Glu |
|     | 370 |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |     |
| Val | Glu | Leu | Lys | Glu | Arg | Lys | His | Arg | Ile | Glu | Asp | Ala | Val | Arg | Asn |
| 385 |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     |     | 400 |
| Ala | Lys | Ala | Ala | Val | Glu | Glu | Gly | Ile | Val | Ala | Gly | Gly | Gly | Val | Ala |

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<210> 117  
 <211> 215  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 117  
 Met Ala Lys Thr Ile Ala Tyr Asp Glu Glu Ala Arg Arg Gly Leu Glu  
 1 5 10 15  
 Arg Gly Leu Asn Ala Leu Ala Asp Ala Val Lys Val Thr Leu Gly Pro  
 20 25 30  
 Lys Gly Arg Asn Val Val Leu Glu Lys Lys Trp Gly Ala Pro Thr Ile  
 35 40 45  
 Thr Asn Asp Gly Val Ser Ile Ala Lys Glu Ile Glu Leu Glu Asp Pro  
 50 55 60  
 Tyr Glu Lys Ile Gly Ala Glu Leu Val Lys Glu Val Ala Lys Lys Thr  
 65 70 75 80  
 Asp Asp Val Ala Gly Asp Gly Thr Thr Thr Ala Thr Val Leu Ala Gln  
 85 90 95  
 Ala Leu Val Arg Glu Gly Leu Arg Asn Val Ala Ala Gly Ala Asn Pro  
 100 105 110  
 Leu Gly Leu Lys Arg Gly Ile Glu Lys Ala Val Glu Ala Val Thr Gln  
 115 120 125  
 Ser Leu Leu Lys Ser Ala Lys Glu Val Glu Thr Lys Glu Gln Ile Ser  
 130 135 140  
 Ala Thr Ala Ala Ile Ser Ala Gly Asp Thr Gln Ile Gly Glu Leu Ile  
 145 150 155 160  
 Ala Glu Ala Met Asp Lys Val Gly Asn Glu Gly Val Ile Thr Val Glu  
 165 170 175  
 Glu Ser Asn Thr Phe Gly Leu Gln Leu Glu Leu Thr Glu Gly Met Arg  
 180 185 190  
 Phe Asp Lys Gly Tyr Ile Ser Gly Tyr Phe Val Thr Asp Ala Glu Arg  
 195 200 205  
 Gln Glu Ala Val Leu Glu Asp  
 210 215

<210> 118  
 <211> 309  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 118  
 Asp Pro Tyr Ile Leu Leu Val Ser Ser Lys Val Ser Thr Val Lys Asp  
 1 5 10 15  
 Leu Leu Pro Leu Leu Glu Lys Val Ile Gln Ala Gly Lys Pro Leu Leu  
 20 25 30  
 Ile Ile Ala Glu Asp Val Glu Gly Glu Ala Leu Ser Thr Leu Val Val  
 35 40 45  
 Asn Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val Lys Ala Pro Gly  
 50 55 60  
 Phe Gly Asp Arg Arg Lys Ala Met Leu Gln Asp Met Ala Ile Leu Thr  
 65 70 75 80  
 Gly Gly Gln Val Val Ser Glu Arg Val Gly Leu Ser Leu Glu Thr Ala  
 85 90 95  
 Asp Val Ser Leu Leu Gly Gln Ala Arg Lys Val Val Val Thr Lys Asp  
 100 105 110  
 Glu Thr Thr Ile Val Glu Gly Ser Gly Asp Ser Asp Ala Ile Ala Gly  
 115 120 125

Arg Val Ala Gln Ile Arg Ala Glu Ile Glu Asn Ser Asp Ser Asp Tyr  
 130 135 140  
 Asp Arg Glu Lys Leu Gln Glu Arg Leu Ala Lys Leu Ala Gly Gly Val  
 145 150 155 160  
 Ala Val Ile Lys Ala Gly Ala Ala Thr Glu Val Glu Leu Lys Glu Arg  
 165 170 175  
 Lys His Arg Ile Glu Asp Ala Val Arg Asn Ala Lys Ala Ala Val Glu  
 180 185 190  
 Glu Gly Ile Val Ala Gly Gly Gly Val Ala Leu Leu Gln Ser Ala Pro  
 195 200 205  
 Ala Leu Asp Asp Leu Gly Leu Thr Gly Asp Glu Ala Thr Gly Ala Asn  
 210 215 220  
 Ile Val Arg Val Ala Leu Ser Ala Pro Leu Lys Gln Ile Ala Phe Asn  
 225 230 235 240  
 Gly Gly Leu Glu Pro Gly Val Val Ala Glu Lys Val Ser Asn Leu Pro  
 245 250 255  
 Ala Gly His Gly Leu Asn Ala Ala Thr Gly Glu Tyr Glu Asp Leu Leu  
 260 265 270  
 Lys Ala Gly Val Ala Asp Pro Val Lys Val Thr Arg Ser Ala Leu Gln  
 275 280 285  
 Asn Ala Ala Ser Ile Ala Ala Leu Phe Leu Thr Thr Glu Ala Val Val  
 290 295 300  
 Ala Asp Lys Pro Glu  
 305

<210> 119  
 <211> 162  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 119  
 ctcgtacagg cgacggagat ctccgacgac gccacgtcgg tacggttggt cgccaccctg 60  
 ttcggcgctg tggtgttgac gttggtgctg tccgggctca acgccaccct catccagggc 120  
 gcaccagaag acagctggcg caggcggatt ccgtcgatct tc 162

<210> 120  
 <211> 1366  
 <212> DNA  
 <213> Mycobacterium vaccae

<220>  
 <221> unsure  
 <222> (955)...(955)

<221> unsure  
 <222> (973)...(973)

<400> 120  
 gatgagcagc gtgctgaact cgacctgggt ggccctgggcc gtcgcggtcg cggtcggggtt 60  
 cccggtgctg ctggtcgtgc tgaccgaggt gcacaacgcg ttgcgtcggc gcggcagcgc 120  
 gctggcccgc ccggtgcaac tctgcgtag ctacatcctg ccgctgggcg cggtgctgct 180  
 cctgctggta caggcgatgg agatctccga cgacgccacg tcggtacggt tggtcgccac 240  
 cctgttcggc gtcgtgttgt tgacgttggt gctgtccggg ctcaacgccca ccctcatcca 300  
 gggcgaccca gaagacagt ggcgcaggcg gattccgtcg atcttcctcg acgtcgcgcg 360  
 cttcgcgctg atcgcggtcg gtatcaccgt gatcatggcc tatgtctggg gcgcgaacgt 420  
 ggggggcctg ttcaccgcac tgggcgtcac ttccatcggt cttggcctgg ctctgcagaa 480  
 ttcggtcggg cagatcatct cgggtctgct gctgctgttc gagcaaccgt tccggctcgg 540

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cgactggatc accgtcccca ccgcggcggg ccggccgtcc gcccacggcc gcgtgggtgga 600
agtcaactgg cgtgcaacac atatcgacac ccggcggaac ctgctggtaa tgcccaacgc 660
cgaactcgcc ggcgcgctcg tcaccaatta cagccggccc gtgggagagc accgggtgac 720
cgctgctcacc accttcaacg ccgcggacac ccccgatgat gtctgcgaga tgctgtcgtc 780
ggtcgcggcg tcgctgcccg aactgcgcac cgacggacag atcgccacgc tctatctcgg 840
tgcggccgaa tacgagaagt cgatcccgtt gcacacaccc gcggtggacg actcggtcag 900
gagcacgtac ctgcatggg tctggtacgc cgcgcgccgg caggaacttc gcctnaacgg 960
cgtcgccgac ganttcgaca cgccggaacg gatcgccctc gccatgcggg ctgtggcgctc 1020
cacactgctc ttggcagacg acgaacagca ggagatcgcc gacgtgggtc gtctgggtccg 1080
ttacggcaac ggggaacgcc tccagcagcc gggtcaggta ccgaccggga tgaggttcat 1140
cgtagacggc agggtgagtc tgtccgtgat cgatcaggac ggcgacgtga tccccgcgcg 1200
gggtgctcgag cgtggcgact tcctggggca gaccacgctg acgcgggaac cggtactggc 1260
gaccgcgcac gcgctggagg aagtcaccgt gctggagatg gcccgtagc agatcgagcg 1320
cctggtgcac cgaaagccga tcctgctgca cgtgatcggg gccgtg 1366

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<210> 121  
 <211> 455  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (318)...(318)

<221> UNSURE  
 <222> (324)...(324)

<400> 121

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Ser | Val | Leu | Asn | Ser | Thr | Trp | Leu | Ala | Trp | Ala | Val | Ala | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ala | Val | Gly | Phe | Pro | Val | Leu | Leu | Val | Val | Leu | Thr | Glu | Val | His | Asn |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Leu | Arg | Arg | Arg | Gly | Ser | Ala | Leu | Ala | Arg | Pro | Val | Gln | Leu | Leu |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Arg | Thr | Tyr | Ile | Leu | Pro | Leu | Gly | Ala | Leu | Leu | Leu | Leu | Leu | Val | Gln |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ala | Met | Glu | Ile | Ser | Asp | Asp | Ala | Thr | Ser | Val | Arg | Leu | Val | Ala | Thr |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | Phe | Gly | Val | Val | Leu | Leu | Thr | Leu | Val | Leu | Ser | Gly | Leu | Asn | Ala |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Thr | Leu | Ile | Gln | Gly | Ala | Pro | Glu | Asp | Ser | Trp | Arg | Arg | Arg | Ile | Pro |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ser | Ile | Phe | Leu | Asp | Val | Ala | Arg | Phe | Ala | Leu | Ile | Ala | Val | Gly | Ile |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr | Val | Ile | Met | Ala | Tyr | Val | Trp | Gly | Ala | Asn | Val | Gly | Gly | Leu | Phe |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Thr | Ala | Leu | Gly | Val | Thr | Ser | Ile | Val | Leu | Gly | Leu | Ala | Leu | Gln | Asn |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Ser | Val | Gly | Gln | Ile | Ile | Ser | Gly | Leu | Leu | Leu | Leu | Phe | Glu | Gln | Pro |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Phe | Arg | Leu | Gly | Asp | Trp | Ile | Thr | Val | Pro | Thr | Ala | Ala | Gly | Arg | Pro |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ser | Ala | His | Gly | Arg | Val | Val | Glu | Val | Asn | Trp | Arg | Ala | Thr | His | Ile |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Asp | Thr | Gly | Gly | Asn | Leu | Leu | Val | Met | Pro | Asn | Ala | Glu | Leu | Ala | Gly |
|     | 210 |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |
| Ala | Ser | Phe | Thr | Asn | Tyr | Ser | Arg | Pro | Val | Gly | Glu | His | Arg | Leu | Thr |



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<400> 123
cgcaattgat gacggcgcg ggcacagtggc gtgacaccgg gatgggagac accggtgaga      60
ccatcctggg cggaccggac aatctgatgc gctcggactc ccggctgttc cgcgagaacc      120
gggagaagtt cctggccgac gtcgtcgagg ggggaacccc gccggaggtc gccgacgaat      180
cggttgaccg ccgcggcacc acgctgggtgc agccgggtgac caccgctcc gtcgaggagg      240
cccaacgcgg caacaccggg acgacgatcg aggacgacta tctcggccac gaggcgttac      300
aggcgtactc accggtggac ctgccgggac tgcactgggt gatcgtggcc aagatcgaca      360
ccgacgaggc gttcgccccg gtggcgcgagt tcaccaggac cctggtgctg tcgacggtga      420
tcatcatctt cggcgtgtcg ctggcgggcca tgetgctggc gcggttggtc gtccgtccga      480
tccggcggtt gcaggccggc gcccagcaga tcagcgggcg tgactaccgc ctcgctctgc      540
cgggtgtgtc tcgtgacgaa ttcggcgacg tgacaacagc tttcaacgac atgagtcgca      600
atctgtcgat caaggacgag ctgctcggcg aggagcgcgc cgagaaccaa cggctgatgc      660
tgtcctgat gcccgaaacc gtgatgcagc gctacctcga cggggaggag acgatcgccc      720
aggaccacaa gaacgtcacg gtgatcttcg ccgacatgat gggcctcgac gagttgtcgc      780
gcatgttgac ctccgaggaa ctgacggcag tgggtcaacga cctgaccgc cagttcgacg      840
ccgcgcggga gagtctcggg gtcgaccacg tgcggacgct gcacgacggg tacctggcca      900
gctcgcgggt aggcgtggcg cggctggaca acgtccggcg cacggtcaat ttcgcatcg      960
aaatggaccg catcatcgac cggcacgccg ccgagtcggg gcacgacctg cggctccgcg     1020
cgggcatcga caccgggtcg gcggccagcg ggctggtggg gcggtccacg ttggcgtacg     1080
acatgtgggg ttcggcggtc gatgtcgctt accaggtgca gcgcgggtcc cccagccccg     1140
gcatctacgt cacctcgcgg gtgcacgagg tcatgcagga aactctcgac ttcgtcgccg     1200
ccggggaggt cgtcggcgag cgcggcgctc agacggtctg gcggttgacg ggccacccg     1259

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<210> 124
<211> 299
<212> PRT
<213> Mycobacterium vaccae

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<400> 124
Met Thr Ile Leu Pro Trp Asn Ala Arg Thr Ser Glu His Pro Thr Arg
 1          5          10          15
Lys Arg Arg Gly Arg Tyr His Leu Leu Ser Arg Met Ser Ile Gln Ser
 20          25          30
Lys Leu Leu Leu Met Leu Leu Leu Thr Ser Ile Leu Ser Ala Ala Val
 35          40          45
Val Gly Phe Ile Gly Tyr Gln Ser Gly Arg Ser Ser Leu Arg Ala Ser
 50          55          60
Val Phe Asp Arg Leu Thr Asp Ile Arg Glu Ser Gln Ser Arg Gly Leu
 65          70          75          80
Glu Asn Gln Phe Ala Asp Leu Lys Asn Ser Met Val Ile Tyr Ser Arg
 85          90          95
Gly Ser Thr Ala Thr Glu Ala Ile Gly Ala Phe Ser Asp Gly Phe Arg
100          105          110
Gln Leu Gly Asp Ala Thr Ile Asn Thr Gly Gln Ala Ala Ser Leu Arg
115          120          125
Arg Tyr Tyr Asp Arg Thr Phe Ala Asn Thr Thr Leu Asp Asp Ser Gly
130          135          140
Asn Arg Val Asp Val Arg Ala Leu Ile Pro Lys Ser Asn Pro Gln Arg
145          150          155          160
Tyr Leu Gln Ala Leu Tyr Thr Pro Pro Phe Gln Asn Trp Glu Lys Ala
165          170          175
Ile Ala Phe Asp Asp Ala Arg Asp Gly Ser Ala Trp Ser Ala Ala Asn
180          185          190
Ala Arg Phe Asn Glu Phe Phe Arg Glu Ile Val His Arg Phe Asn Phe
195          200          205
Glu Asp Leu Met Leu Leu Asp Leu Glu Gly Asn Val Val Tyr Ser Ala
210          215          220

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Tyr Lys Gly Pro Asp Leu Gly Thr Asn Ile Val Asn Gly Pro Tyr Arg  
 225 230 235 240  
 Asn Arg Glu Leu Ser Glu Ala Tyr Glu Lys Ala Val Ala Ser Asn Ser  
 245 250 255  
 Ile Asp Tyr Val Gly Val Thr Asp Phe Gly Trp Tyr Leu Pro Ala Glu  
 260 265 270  
 Glu Pro Thr Ala Trp Phe Leu Ser Pro Val Gly Leu Lys Asp Arg Val  
 275 280 285  
 Asp Gly Val Met Ala Val Gln Phe Pro Gly Ile  
 290 295

<210> 125

<211> 419

<212> PRT

<213> Mycobacterium vaccae

<400> 125

Gln Leu Met Thr Ala Arg Gly Gln Trp Arg Asp Thr Gly Met Gly Asp  
 1 5 10 15  
 Thr Gly Glu Thr Ile Leu Val Gly Pro Asp Asn Leu Met Arg Ser Asp  
 20 25 30  
 Ser Arg Leu Phe Arg Glu Asn Arg Glu Lys Phe Leu Ala Asp Val Val  
 35 40 45  
 Glu Gly Gly Thr Pro Pro Glu Val Ala Asp Glu Ser Val Asp Arg Arg  
 50 55 60  
 Gly Thr Thr Leu Val Gln Pro Val Thr Thr Arg Ser Val Glu Glu Ala  
 65 70 75 80  
 Gln Arg Gly Asn Thr Gly Thr Thr Ile Glu Asp Asp Tyr Leu Gly His  
 85 90 95  
 Glu Ala Leu Gln Ala Tyr Ser Pro Val Asp Leu Pro Gly Leu His Trp  
 100 105 110  
 Val Ile Val Ala Lys Ile Asp Thr Asp Glu Ala Phe Ala Pro Val Ala  
 115 120 125  
 Gln Phe Thr Arg Thr Leu Val Leu Ser Thr Val Ile Ile Phe Gly  
 130 135 140  
 Val Ser Leu Ala Ala Met Leu Leu Ala Arg Leu Phe Val Arg Pro Ile  
 145 150 155 160  
 Arg Arg Leu Gln Ala Gly Ala Gln Gln Ile Ser Gly Gly Asp Tyr Arg  
 165 170 175  
 Leu Ala Leu Pro Val Leu Ser Arg Asp Glu Phe Gly Asp Leu Thr Thr  
 180 185 190  
 Ala Phe Asn Asp Met Ser Arg Asn Leu Ser Ile Lys Asp Glu Leu Leu  
 195 200 205  
 Gly Glu Glu Arg Ala Glu Asn Gln Arg Leu Met Leu Ser Leu Met Pro  
 210 215 220  
 Glu Pro Val Met Gln Arg Tyr Leu Asp Gly Glu Glu Thr Ile Ala Gln  
 225 230 235 240  
 Asp His Lys Asn Val Thr Val Ile Phe Ala Asp Met Met Gly Leu Asp  
 245 250 255  
 Glu Leu Ser Arg Met Leu Thr Ser Glu Leu Met Val Val Val Asn  
 260 265 270  
 Asp Leu Thr Arg Gln Phe Asp Ala Ala Glu Ser Leu Gly Val Asp  
 275 280 285  
 His Val Arg Thr Leu His Asp Gly Tyr Leu Ala Ser Cys Gly Leu Gly  
 290 295 300  
 Val Pro Arg Leu Asp Asn Val Arg Arg Thr Val Asn Phe Ala Ile Glu  
 305 310 315 320

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Met Asp Arg Ile Ile Asp Arg His Ala Ala Glu Ser Gly His Asp Leu  
325 330 335  
Arg Leu Arg Ala Gly Ile Asp Thr Gly Ser Ala Ala Ser Gly Leu Val  
340 345 350  
Gly Arg Ser Thr Leu Ala Tyr Asp Met Trp Gly Ser Ala Val Asp Val  
355 360 365  
Ala Tyr Gln Val Gln Arg Gly Ser Pro Gln Pro Gly Ile Tyr Val Thr  
370 375 380  
Ser Arg Val His Glu Val Met Gln Glu Thr Leu Asp Phe Val Ala Ala  
385 390 395 400  
Gly Glu Val Val Gly Glu Arg Gly Val Glu Thr Val Trp Arg Leu Gln  
405 410 415  
Gly His Pro

<210> 126  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 126  
ccggatccga tgagcagcgt gctgaac 27

<210> 127  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 127  
gcggatccca cggccccgat cacgtg 26

<210> 128  
<211> 33  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 128  
ccggatccaa tgacatttct gccctggaat gcg 33

<210> 129  
<211> 32  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 129

ccggatccat tcggtggccc tgcaaccgcc ag

32

<210> 130

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 130

ccggatccgg agcaaccggt ccggctc

27

<210> 131

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 131

ccggatcccg gctatcagtc cggacgg

27

<210> 132

<211> 844

<212> DNA

<213> Mycobacterium vaccae

<400> 132

|            |             |             |            |            |            |     |
|------------|-------------|-------------|------------|------------|------------|-----|
| gagcaaccgt | tccggctcgg  | cgactggatc  | accgtcccca | ccgcggcggg | ccggccgtcc | 60  |
| gcccacggcc | gcgtggtgga  | agtcaactgg  | cgtgcaacac | atatcgacac | cggcggcaac | 120 |
| ctgctggtaa | tgcccaacgc  | cgaactcgcc  | ggcgcgtcgt | tcaccaatta | cagccggccc | 180 |
| gtgggagagc | accggctgac  | cgctgacacc  | accttcaacg | ccgcggacac | ccccgatgat | 240 |
| gtctgcgaga | tgctgtcgtc  | ggctgcggcg  | tcgctgcccg | aactgcgcac | cgacggacag | 300 |
| atcgccacgc | tctatctcgg  | tgcgggccgaa | tacgagaagt | cgatcccgtt | gcacacaccc | 360 |
| gcggtggacg | actcggtcag  | gagcacgtac  | ctgcgatggg | tctggtacgc | cgcgcgccgg | 420 |
| caggaacttc | gcctaaccggc | gtcgccgacg  | attcgacacg | ccggaacgga | tcgcctcggc | 480 |
| catgcgggct | gtggcggtcca | caactgcgtt  | ggcagacgac | gaacagcagg | agatcgccga | 540 |
| cgtggtgctg | ctggtccgtt  | acggcaacgg  | ggaacgcctc | cagcagccgg | gtcaggtacc | 600 |
| gaccgggatg | aggttcatcg  | tagacggcag  | ggtagtctg  | tccgtgatcg | atcaggacgg | 660 |
| cgacgtgatc | ccggcgccgg  | tgctcgagcg  | tggcgacttc | ctggggcaga | ccacgctgac | 720 |
| gcgggaaccg | gtactggcga  | ccgcgcacgc  | gctggaggaa | gtcaccgtgc | tggagatggc | 780 |
| ccgtgacgag | atcgagcgcc  | tggtgcaccg  | aaagccgatc | ctgctgcacg | tgatcggggc | 840 |
| cgtg       |             |             |            |            |            | 844 |

<210> 133

<211> 742

<212> DNA

<213> Mycobacterium vaccae

<400> 133

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| ggctatcagt | ccggacggtc | ctcgtgcgc  | gcacgggtgt | tcgaccgcct | caccgacatc | 60  |
| cgcgagtgcg | agtcgcgcgg | ggtggagaat | cagttcgcgg | acctgaagaa | ctcgatggtg | 120 |
| atttactcgc | gcggcagcac | tgccacggag | gcgatcggcg | cgttcagcga | cggtttccgt | 180 |
| cagctcggcg | atgcgacgat | caataccggg | caggcggcgt | cattgcgccg | ttactacgac | 240 |
| cggacgttcg | ccaacaccac | cctcgacgac | agcggaaacc | gcgtcgacgt | ccgcgcgctc | 300 |

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atccccgaaat ccaacccccca gcgctatctg cagggcgctct atacccccgcc gtttcagaac 360
tgggagaagg cgatcgcggt cgacgacgcg cgcgacggca ggcctggtc ggccgccaat 420
gccagattca acgagttctt ccgcgagatc gtgcaccgct tcaacttcga ggatctgatg 480
ctgctcgacc tcgagggcaa cgtggtgtac tccgcctaca agggggccga tctcgggaca 540
aacatcgta acggccccta tcgcaaccgg gaactgtcgg aagcctacga gaaggcggtc 600
gcgtcgaaact cgatcgacta tgcgggtgtc accgacttcg ggtggtacct gcctgccgag 660
gaaccgaccg cctgggttcct gtccccgggc ggggtgaagg accgagtcga cggtgtgatg 720
gcggtccagt tccccggaat tc 742

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<210> 134
<211> 282
<212> PRT
<213> Mycobacterium vaccae

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<220>
<221> UNSURE
<222> (145)...(145)

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<221> UNSURE
<222> (151)...(151)

```

```

<400> 134

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Glu Gln Pro Phe Arg Leu Gly Asp Trp Ile Thr Val Pro Thr Ala Ala
1          5          10          15
Gly Arg Pro Ser Ala His Gly Arg Val Val Glu Val Asn Trp Arg Ala
20          25          30
Thr His Ile Asp Thr Gly Gly Asn Leu Leu Val Met Pro Asn Ala Glu
35          40          45
Leu Ala Gly Ala Ser Phe Thr Asn Tyr Ser Arg Pro Val Gly Glu His
50          55          60
Arg Leu Thr Val Val Thr Thr Phe Asn Ala Ala Asp Thr Pro Asp Asp
65          70          75          80
Val Cys Glu Met Leu Ser Ser Val Ala Ala Ser Leu Pro Glu Leu Arg
85          90          95
Thr Asp Gly Gln Ile Ala Thr Leu Tyr Leu Gly Ala Ala Glu Tyr Glu
100          105          110
Lys Ser Ile Pro Leu His Thr Pro Ala Val Asp Asp Ser Val Arg Ser
115          120          125
Thr Tyr Leu Arg Trp Val Trp Tyr Ala Ala Arg Arg Gln Glu Leu Arg
130          135          140
Xaa Asn Gly Val Ala Asp Xaa Phe Asp Thr Pro Glu Arg Ile Ala Ser
145          150          155          160
Ala Met Arg Ala Val Ala Ser Thr Leu Arg Leu Ala Asp Asp Glu Gln
165          170          175
Gln Glu Ile Ala Asp Val Val Arg Leu Val Arg Tyr Gly Asn Gly Glu
180          185          190
Arg Leu Gln Gln Pro Gly Gln Val Pro Thr Gly Met Arg Phe Ile Val
195          200          205
Asp Gly Arg Val Ser Leu Ser Val Ile Asp Gln Asp Gly Asp Val Ile
210          215          220
Pro Ala Arg Val Leu Glu Arg Gly Asp Phe Leu Gly Gln Thr Thr Leu
225          230          235          240
Thr Arg Glu Pro Val Leu Ala Thr Ala His Ala Leu Glu Glu Val Thr
245          250          255
Val Leu Glu Met Ala Arg Asp Glu Ile Glu Arg Leu Val His Arg Lys
260          265          270
Pro Ile Leu Leu His Val Ile Gly Ala Val

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275

280

&lt;210&gt; 135

&lt;211&gt; 247

&lt;212&gt; PRT

&lt;213&gt; Mycobacterium vaccae

&lt;400&gt; 135

Gly Tyr Gln Ser Gly Arg Ser Ser Leu Arg Ala Ser Val Phe Asp Arg  
 1 5 10 15  
 Leu Thr Asp Ile Arg Glu Ser Gln Ser Arg Gly Leu Glu Asn Gln Phe  
 20 25 30  
 Ala Asp Leu Lys Asn Ser Met Val Ile Tyr Ser Arg Gly Ser Thr Ala  
 35 40 45  
 Thr Glu Ala Ile Gly Ala Phe Ser Asp Gly Phe Arg Gln Leu Gly Asp  
 50 55 60  
 Ala Thr Ile Asn Thr Gly Gln Ala Ala Ser Leu Arg Arg Tyr Tyr Asp  
 65 70 75 80  
 Arg Thr Phe Ala Asn Thr Thr Leu Asp Asp Ser Gly Asn Arg Val Asp  
 85 90 95  
 Val Arg Ala Leu Ile Pro Lys Ser Asn Pro Gln Arg Tyr Leu Gln Ala  
 100 105 110  
 Leu Tyr Thr Pro Pro Phe Gln Asn Trp Glu Lys Ala Ile Ala Phe Asp  
 115 120 125  
 Asp Ala Arg Asp Gly Ser Ala Trp Ser Ala Ala Asn Ala Arg Phe Asn  
 130 135 140  
 Glu Phe Phe Arg Glu Ile Val His Arg Phe Asn Phe Glu Asp Leu Met  
 145 150 155 160  
 Leu Leu Asp Leu Glu Gly Asn Val Val Tyr Ser Ala Tyr Lys Gly Pro  
 165 170 175  
 Asp Leu Gly Thr Asn Ile Val Asn Gly Pro Tyr Arg Asn Arg Glu Leu  
 180 185 190  
 Ser Glu Ala Tyr Glu Lys Ala Val Ala Ser Asn Ser Ile Asp Tyr Val  
 195 200 205  
 Gly Val Thr Asp Phe Gly Trp Tyr Leu Pro Ala Glu Glu Pro Thr Ala  
 210 215 220  
 Trp Phe Leu Ser Pro Val Gly Leu Lys Asp Arg Val Asp Gly Val Met  
 225 230 235 240  
 Ala Val Gln Phe Pro Gly Ile  
 245

&lt;210&gt; 136

&lt;211&gt; 45

&lt;212&gt; DNA

&lt;213&gt; Mycobacterium vaccae

&lt;220&gt;

&lt;221&gt; unsure

&lt;222&gt; (18)...(18)

&lt;400&gt; 136

atgagcgaaa tcgcccgncc ctggcggggtt ctggcatgtg gcatac

45

&lt;210&gt; 137

&lt;211&gt; 340

&lt;212&gt; DNA

&lt;213&gt; Mycobacterium vaccae

<220>  
<221> unsure  
<222> (273)...(273)

<221> unsure  
<222> (286)...(286)

<400> 137  
gccaccggcg ggcgcgccc ggtgcccgc ggggtgagcg ccccggcggt cgcgcggcc 60  
cccgcgatgc ccgcccggc ggtgtccacg atcgcgccg cgacctcggg cacgctcagc 120  
gagtttttcg ccgccaaggg cgtcacgatg gagccgcagt ccagccgcga cttccgcgcc 180  
ctcaacatcg tgctgccgaa gccgcggggc tgggagcaca tcccggacct gaacgtgccg 240  
gacgcgttcg cgggtgctggc cgaccggggtc agnggtaaag gtcagnagtc gacaaacgcc 300  
cacgtggtgg tcgacaaaca cgtaggcgag ttcgacggca 340

<210> 138  
<211> 235  
<212> DNA  
<213> Mycobacterium vaccae

<220>  
<221> unsure  
<222> (16)...(16)

<400> 138  
ggtgaccacc agcgtngaac aggtcggttc cgaagccgcg gaggccaccg acgcgattgt 60  
caacggcttc aaggtcagcg ttccgggtcc gggtcgggcc gcaccgccac ctgcaccggg 120  
tgcccccggt gtcccgcccg ccccgggcgc cccggcgctg ccgctggccg tcgcaccacc 180  
cccggtccc gctgttccc cggtggcgcc cgcgccacag ctgctgggac tgcag 235

<210> 139  
<211> 15  
<212> PRT  
<213> Mycobacterium vaccae

<400> 139  
Met Ser Glu Ile Ala Arg Pro Trp Arg Val Leu Ala Cys Gly Ile  
1 5 10 15

<210> 140  
<211> 113  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (96)...(96)

<400> 140  
Ala Thr Gly Gly Ala Ala Val Pro Ala Gly Val Ser Ala Pro Ala  
1 5 10 15  
Val Ala Pro Ala Pro Ala Met Pro Ala Arg Pro Val Ser Thr Ile Ala  
20 25 30  
Pro Ala Thr Ser Gly Thr Leu Ser Glu Phe Phe Ala Ala Lys Gly Val  
35 40 45  
Thr Met Glu Pro Gln Ser Ser Arg Asp Phe Arg Ala Leu Asn Ile Val

50                      55                      60  
 Leu Pro Lys Pro Arg Gly Trp Glu His Ile Pro Asp Pro Asn Val Pro  
 65                      70                      75                      80  
 Asp Ala Phe Ala Val Leu Ala Asp Arg Val Gly Gly Lys Gly Gln Xaa  
                     85                      90                      95  
 Ser Thr Asn Ala His Val Val Val Asp Lys His Val Gly Glu Phe Asp  
                     100                      105                      110  
 Gly

<210> 141  
 <211> 73  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 141  
 Val Thr Thr Ser Val Glu Gln Val Val Ala Ala Ala Asp Ala Thr Glu  
 1                      5                      10                      15  
 Ala Ile Val Asn Gly Phe Lys Val Ser Val Pro Gly Pro Gly Pro Ala  
                     20                      25                      30  
 Ala Pro Pro Pro Ala Pro Gly Ala Pro Gly Val Pro Pro Ala Pro Gly  
                     35                      40                      45  
 Ala Pro Ala Leu Pro Leu Ala Val Ala Pro Pro Pro Ala Pro Ala Val  
                     50                      55                      60  
 Pro Ala Val Ala Pro Ala Pro Gln Leu  
 65                      70

<210> 142  
 <211> 273  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 142  
 ggcacctacg tgcagggggg tctcgccgc atcgagggcc ggggtggccga cagcggatac 60  
 agcaacgccg cgccaagggt ctacttcccg ctgagcttca ccgtcgccgg catcgaccag 120  
 aacgggtccga tcgtgaccgc caacgtcacc gcgggcgccc cgacggggcg cgtggccacc 180  
 cagccgctga cgttcacgc cgggcccagc cgcaccgat ggcagctgtc caagcagtcc 240  
 gcactggccc tgatgtccgc ggtcatcgcc gca 273

<210> 143  
 <211> 91  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 143  
 Ala Thr Tyr Val Gln Gly Gly Leu Gly Arg Ile Glu Ala Arg Val Ala  
 1                      5                      10                      15  
 Asp Ser Gly Tyr Ser Asn Ala Ala Lys Gly Tyr Phe Pro Leu Ser  
                     20                      25                      30  
 Phe Thr Val Ala Gly Ile Asp Gln Asn Gly Pro Ile Val Thr Ala Asn  
                     35                      40                      45  
 Val Thr Ala Ala Ala Pro Thr Gly Ala Val Ala Thr Gln Pro Leu Thr  
                     50                      55                      60  
 Phe Ile Ala Gly Pro Ser Pro Thr Gly Trp Gln Leu Ser Lys Gln Ser  
 65                      70                      75                      80  
 Ala Leu Ala Leu Met Ser Ala Val Ile Ala Ala  
                     85                      90

<210> 144  
 <211> 554  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 144

|            |             |            |            |            |            |     |
|------------|-------------|------------|------------|------------|------------|-----|
| gatgtcacgc | ccggagaatg  | taacgttcga | ccggagaacg | ccgtcggcac | aacgagttac | 60  |
| gtttgagcac | ttcagatctc  | ggttaccttg | gatttcaggc | gggggaagca | gtaaccgatc | 120 |
| caagattcga | aggacccaaa  | caacatgaaa | ttcactggaa | tgaccgtgcg | cgcaagccgc | 180 |
| gcgccttggc | cggcgctcggg | gcggcatgtc | tgttcggcgg | cgtggcccg  | gcaaccgtgg | 240 |
| cggcacagat | ggcgggcgcc  | cagccggccg | agtgaacgc  | cagctcactc | accggcaccg | 300 |
| tcagtcggt  | gaccggtcag  | gcgcgtcagt | acctagacac | ccaccgggc  | gccaaccagg | 360 |
| ccgtcaccgc | ggcgatgaac  | cagccgcggc | ccgaggccga | ggcgaacctg | cggggtact  | 420 |
| tcaccgcaa  | cccggcggag  | tactacgacc | tgcggggcat | cctcgccccg | atcggtgacg | 480 |
| cgcagcgcaa | ctgcaacatc  | accgtgctgc | cggtagagct | gcagacggcc | tacgacacgt | 540 |
| tcattggccg | ctga        |            |            |            |            | 554 |

<210> 145  
 <211> 136  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 145

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Phe | Thr | Gly | Met | Thr | Val | Arg | Ala | Ser | Arg | Arg | Ala | Leu | Ala |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Gly | Val | Gly | Ala | Ala | Cys | Leu | Phe | Gly | Gly | Val | Ala | Ala | Ala | Thr | Val |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Ala | Gln | Met | Ala | Gly | Ala | Gln | Pro | Ala | Glu | Cys | Asn | Ala | Ser | Ser |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Leu | Thr | Gly | Thr | Val | Ser | Ser | Val | Thr | Gly | Gln | Ala | Arg | Gln | Tyr | Leu |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Asp | Thr | His | Pro | Gly | Ala | Asn | Gln | Ala | Val | Thr | Ala | Ala | Met | Asn | Gln |
| 65  |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |     |
| Pro | Arg | Pro | Glu | Ala | Glu | Ala | Asn | Leu | Arg | Gly | Tyr | Phe | Thr | Ala | Asn |
|     |     |     |     | 85  |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Pro | Ala | Glu | Tyr | Tyr | Asp | Leu | Arg | Gly | Ile | Leu | Ala | Pro | Ile | Gly | Asp |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ala | Gln | Arg | Asn | Cys | Asn | Ile | Thr | Val | Leu | Pro | Val | Glu | Leu | Gln | Thr |
|     | 115 |     |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Ala | Tyr | Asp | Thr | Phe | Met | Ala | Gly |     |     |     |     |     |     |     |     |
|     | 130 |     |     |     |     | 135 |     |     |     |     |     |     |     |     |     |

<210> 146  
 <211> 808  
 <212> DNA  
 <213> Mycobacterium vaccae

<220>

<221> unsure  
 <222> (15)...(15)

<400> 146

|            |             |            |             |            |            |     |
|------------|-------------|------------|-------------|------------|------------|-----|
| ccaagtgtga | cgcnngtgtg  | acggtagacg | ttccgaccaa  | tccaacgacg | ccgcagctgg | 60  |
| gaatcacccg | tgtgccaaatt | cagtgcgggc | aacgggtgtcc | gtccacgaag | ggattcagga | 120 |
| aatgatgaca | actcgccgga  | agtcagccgc | agtggcgggg  | atcgctgcgg | tggccatcct | 180 |
| cgggtcggcc | gcatgttcga  | gtgaggacgg | tgggagcacg  | gcctcgtcgg | ccagcagcac | 240 |



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ggcctcctcc gcgatggagt ccgcgaccga cgagatgacc acgtcgtcgg cggcccccttc 300
ggccgaccct gcggccaacc tgatcggttc cggctgcgcg gcctacgccg agcaggtccc 360
cgaaggtccc gggtcggtgg ccgggatggc agccgatccg gtgacggtgg cggcgctcgaa 420
caaccgatg ctgcagacgc tgtcccaggc gctgtccggc cagctcaatc cgcaggtcaa 480
tctcgtcgac accctcgacg gcggtgagtt caccgtgttc gcgccgaccg acgacgcgtt 540
cgccaagatc gatccggcca cgctggagac cctcaagacg gactccgaca tgctgaccaa 600
catcctgacc taccacgtcg tgcccggcca ggccgcgccc gatcaggtgg tcggcgagca 660
tgtgacggtg gagggggcgc cggtcacggt gtccgggatg gccgaccagc tcaaggtcaa 720
cgacgcgtcg gtggtgtgcg gtgggggtgca gaccgccaac gcgacggtgt atctgatcga 780
caccgtgctg atgccgccgg cagcgtag
808

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<210> 147  
 <211> 228  
 <212> PRT  
 <213> Mycobacterium vaccae

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<400> 147
Met Met Thr Thr Arg Arg Lys Ser Ala Ala Val Ala Gly Ile Ala Ala
1      5      10      15
Val Ala Ile Leu Gly Ala Ala Ala Cys Ser Ser Glu Asp Gly Gly Ser
20     25     30
Thr Ala Ser Ser Ala Ser Ser Thr Ala Ser Ser Ala Met Glu Ser Ala
35     40     45
Thr Asp Glu Met Thr Thr Ser Ser Ala Ala Pro Ser Ala Asp Pro Ala
50     55     60
Ala Asn Leu Ile Gly Ser Gly Cys Ala Ala Tyr Ala Glu Gln Val Pro
65     70     75     80
Glu Gly Pro Gly Ser Val Ala Gly Met Ala Ala Asp Pro Val Thr Val
85     90     95
Ala Ala Ser Asn Asn Pro Met Leu Gln Thr Leu Ser Gln Ala Leu Ser
100    105    110
Gly Gln Leu Asn Pro Gln Val Asn Leu Val Asp Thr Leu Asp Gly Gly
115    120    125
Glu Phe Thr Val Phe Ala Pro Thr Asp Asp Ala Phe Ala Lys Ile Asp
130    135    140
Pro Ala Thr Leu Glu Thr Leu Lys Thr Asp Ser Asp Met Leu Thr Asn
145    150    155    160
Ile Leu Thr Tyr His Val Val Pro Gly Gln Ala Ala Pro Asp Gln Val
165    170    175
Val Gly Glu His Val Thr Val Glu Gly Ala Pro Val Thr Val Ser Gly
180    185    190
Met Ala Asp Gln Leu Lys Val Asn Asp Ala Ser Val Val Cys Gly Gly
195    200    205
Val Gln Thr Ala Asn Ala Thr Val Tyr Leu Ile Asp Thr Val Leu Met
210    215    220
Pro Pro Ala Ala
225

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<210> 148  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Made in a lab  
 <221> unsure

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<222> (12)...(12)

<221> unsure

<222> (17)...(17)

<400> 148

gcscsctsg gnccggntgy gc

22

<210> 149

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<221> unsure

<222> (10)...(10)

<221> unsure

<222> (13)...(13)

<221> unsure

<222> (16)...(16)

<221> unsure

<222> (20)...(20)

<400> 149

rtasgcsgcn gtngcnacng g

21

<210> 150

<211> 102

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 150

gccccgctcg gccccggctg tgcggcctac gtgcaacagg tgccggacgg gccgggatcg  
gtgcagggca tggcgagctc gcccgtagcg accgccgcgt at

60

102

<210> 151

<211> 683

<212> DNA

<213> Mycobacterium vaccae

<400> 151

gcccgcacac taaaaccgcc gatcatccac tgcaggaagg aatctcacga tcatgaacat 60  
cagcatgaaa actcttgccg gagcgggttt cgcgatgacc gccgccgctg gtctgtcgct 120  
gggtaccgca ggcagcgccg cagccgcgcc ggtcggaccg ggggtgtgctg cctacgtgca 180  
acagggtgccg gacggggccg gatcggtgca gggcatggcg agctcgccgg tggccaccgc 240  
ggcggccgac aaccgctgc tcaccacgct ctgcgaggcg atctcggttc agctcaaccc 300  
gaacgtcaat ctctgtcgaca cggttaacgg cggccagttc accgtgttcg cgccgaccaa 360  
tgacgccttc gccaaagatcg atccggccac gctggagacc ctcaagaccg attccgacct 420  
gctgaccaag atcctcacct accacgtcgt gccgggccag gccgcgcccg atcaggtggt 480

cggcgagcat gtgacggtgg agggggcgcc ggtcacggtg tccgggatgg ccgaccagct 540  
 caaggtcaac gacgcgtcgg tgggtgtcgg tgggggtgcag accgccaacg cgacggtgta 600  
 tctgatcgac accgtgctga tgccgcccggc agcgtagccg ggcggcacca cagaagaggg 660  
 tccccgcac ccggcctccc ccg 683

<210> 152  
 <211> 231  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 152  
 Asp Thr Val Leu Met Pro Pro Ala Asn Asn Arg Arg Ser Ser Thr Ala  
 1 5 10 15  
 Gly Arg Asn Leu Thr Ile Met Asn Ile Ser Met Lys Thr Leu Ala Gly  
 20 25 30  
 Ala Gly Phe Ala Met Thr Ala Ala Val Gly Leu Ser Leu Gly Thr Ala  
 35 40 45  
 Gly Ser Ala Ala Ala Pro Val Gly Pro Gly Cys Ala Ala Tyr Val  
 50 55 60  
 Gln Gln Val Pro Asp Gly Pro Gly Ser Val Gln Gly Met Ala Ser Ser  
 65 70 75 80  
 Pro Val Ala Thr Ala Ala Ala Asp Asn Pro Leu Leu Thr Thr Leu Ser  
 85 90 95  
 Gln Ala Ile Ser Gly Gln Leu Asn Pro Asn Val Asn Leu Val Asp Thr  
 100 105 110  
 Phe Asn Gly Gly Gln Phe Thr Val Phe Ala Pro Thr Asn Asp Ala Phe  
 115 120 125  
 Ala Lys Ile Asp Pro Ala Thr Leu Glu Thr Leu Lys Thr Asp Ser Asp  
 130 135 140  
 Leu Leu Thr Lys Ile Leu Thr Tyr His Val Val Pro Gly Gln Ala Ala  
 145 150 155 160  
 Pro Asp Gln Val Val Gly Glu His Val Thr Val Glu Gly Ala Pro Val  
 165 170 175  
 Thr Val Ser Gly Met Ala Asp Gln Leu Lys Val Asn Asp Ala Ser Val  
 180 185 190  
 Val Cys Gly Gly Val Gln Thr Ala Asn Ala Thr Val Tyr Leu Ile Asp  
 195 200 205  
 Thr Val Leu Met Pro Pro Ala Ala Pro Gly Gly Thr Thr Glu Glu Gly  
 210 215 220  
 Pro Pro His Pro Ala Ser Pro  
 225 230

<210> 153  
 <211> 1125  
 <212> DNA  
 <213> Mycobacterium vaccae

<220>  
 <221> unsure  
 <222> (358)...(358)

<400> 153  
 atgcagggtgc ggcgtgttct gggcagtgtc ggtgcagcag tccggttttc ggccgcgtta 60  
 tggcagacgg gggtttcgat accgaccgcc tcagcggatc cgtgtccgga catcgagggt 120  
 atcttcgcgc gcgggaccgg tgcggaacccc ggccctcggtt gggtcggtga tgcgttcgtc 180  
 aacgcgctgc ggcccaaggc cgggtgagcag tcggtgggca cctacgcggt gaactaccgc 240  
 gcaggattcg gacttcgaca aatcggcgcc catgggcgcg gccgacgcat cggggcgggt 300

|             |            |            |            |             |            |      |
|-------------|------------|------------|------------|-------------|------------|------|
| gcagtggatg  | gccgacaact | gcccggacac | caagcttgtc | ctggggcggca | tgtcgcangg | 360  |
| cgccggcgtc  | atcgacctga | tcaccgtcga | tccgcgaccg | ctggggccggt | tcacccccac | 420  |
| cccgatgccg  | ccccgcgtcg | ccgaccacgt | ggccgcggtt | gtggtcttcg  | gaaatccgtt | 480  |
| gcgcgacatc  | cgtggtggcg | gtccgctgcc | gcagatgagc | ggcacctacg  | ggccgaagtc | 540  |
| gatcgatctg  | tgtgcgctcg | acgatccgtt | ctgctcgccc | ggcttcaacc  | tgccggccca | 600  |
| cttcgcctac  | gccgacaacg | gcatggtgga | ggaagcccg  | aacttcgccc  | gcctggaacc | 660  |
| gggcccagagc | gtcgagctgc | ccgaggcgcc | ctacctgcac | ctgttcgtcc  | cgcggggcga | 720  |
| ggtaacgctg  | gaggacgccc | gaccgctgcg | cgaaggcgac | gcagtgcgtt  | tcaccgcatc | 780  |
| gggcccggcag | cgggtgaccg | ccaccgcgcc | cgcgagatc  | ctcgtctggg  | agatgcatgc | 840  |
| gggactcggg  | gcggcataag | cgaataggag | tccgtctggc | cgcgcgagca  | ctgctcgccg | 900  |
| gatgcacatc  | cgaacctgga | cccggggccg | cggcggcacc | ggccccgacg  | agcacaaccg | 960  |
| agagcgcacc  | cgggtcccga | ctcgtcccgg | tgaccgtcgc | ggtcgacgaa  | cctctggccg | 1020 |
| acgcgcggtt  | cgaccagccc | cgggaggccc | tggtgccgca | gggttgacg   | ctgtcggtgt | 1080 |
| gggcgcggac  | cgcccggccg | cggctggccg | cgtgggcccc | ggacg       |            | 1125 |

<210> 154  
 <211> 748  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (119)... (119)

<400> 154

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Val | Arg | Arg | Val | Leu | Gly | Ser | Val | Gly | Ala | Ala | Val | Ala | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Ala | Ala | Leu | Trp | Gln | Thr | Gly | Val | Ser | Ile | Pro | Thr | Ala | Ser | Ala |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Asp | Pro | Cys | Pro | Asp | Ile | Glu | Val | Ile | Phe | Ala | Arg | Gly | Thr | Gly | Ala |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Glu | Pro | Gly | Leu | Gly | Trp | Val | Gly | Asp | Ala | Phe | Val | Asn | Ala | Leu | Arg |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Lys | Val | Gly | Glu | Gln | Ser | Val | Gly | Thr | Tyr | Ala | Val | Asn | Tyr | Pro |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Ala | Gly | Phe | Asp | Phe | Asp | Lys | Ser | Ala | Pro | Met | Gly | Ala | Ala | Asp | Ala |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ser | Gly | Arg | Val | Gln | Trp | Met | Ala | Asp | Asn | Cys | Pro | Asp | Thr | Lys | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Leu | Gly | Gly | Met | Ser | Xaa | Gly | Ala | Gly | Val | Ile | Asp | Leu | Ile | Thr |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Asp | Pro | Arg | Pro | Leu | Gly | Arg | Phe | Thr | Pro | Thr | Pro | Met | Pro | Pro |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Arg | Val | Ala | Asp | His | Val | Ala | Ala | Val | Val | Val | Phe | Gly | Asn | Pro | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |
| Arg | Asp | Ile | Arg | Gly | Gly | Gly | Pro | Arg | Leu | Glu | Pro | Arg | Gly | Leu | Asn |
|     |     |     |     | 165 |     |     |     | 170 |     |     |     |     | 175 |     |     |
| Met | Glu | Thr | Ser | Glu | Arg | Gly | Leu | Tyr | Thr | His | Arg | Thr | Tyr | Arg | Gly |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Leu | Tyr | Pro | Arg | Leu | Tyr | Ser | Ser | Glu | Arg | Ile | Leu | Glu | Ala | Ser | Pro |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Leu | Glu | Cys | Tyr | Ser | Ala | Leu | Ala | Leu | Glu | Ala | Ser | Pro | Ala | Ser | Pro |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Pro | Arg | Pro | His | Glu | Cys | Tyr | Ser | Ser | Glu | Arg | Pro | Arg | Gly | Leu | Tyr |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |     |
| Pro | His | Glu | Ala | Ser | Asn | Leu | Glu | Pro | Arg | Ala | Leu | Ala | His | Ile | Ser |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | His | Glu | Ala | Leu | Ala | Thr | Tyr | Arg | Ala | Leu | Ala | Ala | Ser | Pro | Ala |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Ser | Asn | Gly | Leu | Tyr | Met | Glu | Thr | Val | Ala | Leu | Gly | Leu | Gly | Leu | Ala |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Leu | Ala | Ala | Leu | Ala | Ala | Ser | Asn | Pro | His | Glu | Ala | Leu | Ala | Ala | Arg |
|     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Gly | Leu | Glu | Gly | Leu | Pro | Arg | Gly | Leu | Tyr | Gly | Leu | Asn | Ser | Glu | Arg |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Val | Ala | Leu | Gly | Leu | Leu | Glu | Pro | Arg | Gly | Leu | Ala | Leu | Ala | Pro | Arg |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Thr | Tyr | Arg | Leu | Glu | His | Ile | Ser | Leu | Glu | Pro | His | Glu | Val | Ala | Leu |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Pro | Arg | Ala | Arg | Gly | Gly | Leu | Tyr | Gly | Leu | Val | Ala | Leu | Thr | His | Arg |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Leu | Glu | Gly | Leu | Ala | Ser | Pro | Ala | Leu | Ala | Gly | Leu | Tyr | Pro | Arg | Leu |
|     |     | 370 |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Glu | Ala | Arg | Gly | Gly | Leu | Gly | Leu | Tyr | Ala | Ser | Pro | Ala | Leu | Ala | Val |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Ala | Leu | Ala | Arg | Gly | Pro | His | Glu | Thr | His | Arg | Ala | Leu | Ala | Ser | Glu |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Arg | Gly | Leu | Tyr | Gly | Leu | Tyr | Gly | Leu | Asn | Ala | Arg | Gly | Val | Ala | Leu |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Thr | His | Arg | Ala | Leu | Ala | Thr | His | Arg | Ala | Leu | Ala | Pro | Arg | Ala | Leu |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Ala | Gly | Leu | Ile | Leu | Glu | Leu | Glu | Val | Ala | Leu | Thr | Arg | Pro | Gly | Leu |
|     |     | 450 |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Met | Glu | Thr | His | Ile | Ser | Ala | Leu | Ala | Gly | Leu | Tyr | Leu | Glu | Gly | Leu |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Tyr | Ala | Leu | Ala | Ala | Leu | Ala | Ala | Leu | Ala | Ala | Ser | Asn | Ala | Arg | Gly |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |
| Ser | Glu | Arg | Pro | Arg | Ala | Leu | Ala | Gly | Leu | Tyr | Ala | Arg | Gly | Ala | Arg |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |
| Gly | Ser | Glu | Arg | Thr | His | Arg | Ala | Leu | Ala | Ala | Arg | Gly | Ala | Arg | Gly |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Met | Glu | Thr | His | Ile | Ser | Ile | Leu | Glu | Ala | Arg | Gly | Thr | His | Arg | Thr |
|     |     | 530 |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |
| Arg | Pro | Thr | His | Arg | Ala | Arg | Gly | Ala | Leu | Ala | Val | Ala | Leu | Gly | Leu |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |
| Tyr | Gly | Leu | Tyr | Thr | His | Arg | Gly | Leu | Tyr | Pro | Arg | Ala | Ser | Pro | Gly |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |
| Leu | His | Ile | Ser | Ala | Ser | Asn | Ala | Arg | Gly | Gly | Leu | Ala | Arg | Gly | Thr |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |
| His | Arg | Ala | Arg | Gly | Ser | Glu | Arg | Ala | Arg | Gly | Thr | His | Arg | Ala | Arg |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     |     |     |     |     |



Asp Ser Val Thr Thr Tyr Gly Ala Pro Trp Asn Met Asn  
210 215 220

<210> 157  
<211> 480  
<212> DNA  
<213> Mycobacterium vaccae

<400> 157

|            |            |            |             |            |            |     |
|------------|------------|------------|-------------|------------|------------|-----|
| aacggctggg | acatcaacac | ccctgcgttc | gagtgggttct | acgagtcgag | cttgtcgcgc | 60  |
| atcatgccgg | tcggcggaca | gtccagcttc | tacagcgact  | ggtaccagcc | gtctcggggc | 120 |
| aacgggcaga | actacaccta | caagtgggag | acgttcctga  | cccaggagct | gccgacgtgg | 180 |
| ctggaggcca | accgcggagt | gtcgcgcacc | ggcaacgcgt  | tcgtcggcct | gtcgatggcg | 240 |
| ggcagcgcg  | cgctgacct  | cgcgatccat | cacccgcagc  | agttcatcta | cgctcgtcg  | 300 |
| ctgtcaggct | tcctgaaccc | gtccgagggc | tggtggccga  | tgctgatcgg | gctggcgatg | 360 |
| aacgacgcag | gcggcttcaa | cgccgagagc | atgtggggcc  | cgctctcgga | cccggcgtag | 420 |
| aagcgcaacg | acccgatggg | caacatcaac | cagctggtag  | ccaacaacac | ccggatctgg | 480 |

<210> 158  
<211> 161  
<212> PRT  
<213> Mycobacterium vaccae

<400> 158

|   |                 |
|---|-----------------|
| Asn Gly Trp Asp Ile Asn Thr Pro Ala Phe Glu Trp Phe Tyr Glu Ser | 1 5 10 15       |
| Gly Leu Ser Thr Ile Met Pro Val Gly Gly Gln Ser Ser Phe Tyr Ser | 20 25 30        |
| Asp Trp Tyr Gln Pro Ser Arg Gly Asn Gly Gln Asn Tyr Thr Tyr Lys | 35 40 45        |
| Trp Glu Thr Phe Leu Thr Gln Glu Leu Pro Thr Trp Leu Glu Ala Asn | 50 55 60        |
| Arg Gly Val Ser Arg Thr Gly Asn Ala Phe Val Gly Leu Ser Met Ala | 65 70 75 80     |
| Gly Ser Ala Ala Leu Thr Tyr Ala Ile His His Pro Gln Gln Phe Ile | 85 90 95        |
| Tyr Ala Ser Ser Leu Ser Gly Phe Leu Asn Pro Ser Glu Gly Trp Trp | 100 105 110     |
| Pro Met Leu Ile Gly Leu Ala Met Asn Asp Ala Gly Gly Phe Asn Ala | 115 120 125     |
| Glu Ser Met Trp Gly Pro Ser Ser Asp Pro Ala Trp Lys Arg Asn Asp | 130 135 140     |
| Pro Met Val Asn Ile Asn Gln Leu Val Ala Asn Asn Thr Arg Ile Trp | 145 150 155 160 |
| Ile   |                 |

<210> 159  
<211> 1626  
<212> DNA  
<213> Mycobacterium vaccae

<400> 159

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| atggccaaga | caattgcgta | tgacgaagag | gccgcgcgtg | gcctcgagcg | gggcctcaac | 60  |
| gccctcgag  | acgccgtaaa | ggtgacgttg | ggcccgaagg | gtcgcaacgt | cgtgctggag | 120 |
| aagaagtggg | gcgccccac  | gatcaccaac | gatggtgtgt | ccatcgccaa | ggagatcgag | 180 |
| ctggaggacc | cgtacgagaa | gatcggcgct | gagctggtca | aagaggtcgc | caagaagacc | 240 |

|            |            |            |            |             |             |      |
|------------|------------|------------|------------|-------------|-------------|------|
| gacgacgtcg | cgggcgacgg | caccaccacc | gccaccgtgc | tcgctcaggc  | tctggttcgc  | 300  |
| gaaggcctgc | gcaacgtcgc | agccggcgcc | aaccgcgtcg | gcctcaagcg  | tggcatcgag  | 360  |
| aaggctgtcg | aggtgtcac  | ccagtcgctg | ctgaagtcgg | ccaaggaggt  | cgagaccaag  | 420  |
| gagcagattt | ctgccaccgc | ggcgatttcc | gccggcgaca | cccagatcgg  | cgagctcatc  | 480  |
| gccgaggcca | tggacaaggt | cggcaacgag | ggtgtcatca | ccgtcgagga  | gtcgaacacc  | 540  |
| ttcggcctgc | agctcgagct | caccgagggg | atgcgcttcg | acaaggggta  | catctcgggt  | 600  |
| tacttcgtga | ccgacgccga | gcgccaggaa | gccgtcctgg | aggatcccta  | catcctgctg  | 660  |
| gtcagctcca | aggtgtcgac | cgtcaaggat | ctgctcccgc | tgctggagaa  | ggatcatccag | 720  |
| gccggcaagc | cgctgctgat | catcgccgag | gacgtcgagg | gcgaggccct  | gtccacgctg  | 780  |
| gtggtcaaca | agatccgcgg | caccttcaag | tccgtcgccg | tcaaggctcc  | gggcttcggg  | 840  |
| gaccgccgca | aggcgatgct | gcaggacatg | gccatcctca | ccggtgggtca | ggtcgtcagc  | 900  |
| gaaagagtcg | ggctgtccct | ggagaccgcc | gacgtctcgc | tgctgggcca  | ggcccgcgca  | 960  |
| gtcgtcgtca | ccaaggacga | gaccaccatc | gtcgaggggt | cgggcgattc  | cgatgccatc  | 1020 |
| gccggccggg | tggctcagat | ccgcgccgag | atcgagaaca | gcgactccga  | ctacgaccgc  | 1080 |
| gagaagctgc | aggagcgct  | ggccaagctg | gccggcggtg | ttgcggtgat  | caaggccgga  | 1140 |
| gctgccaccg | aggtggaagc | caaggagcgc | aagcaccgca | tcgaggacgc  | cgtccgcaac  | 1200 |
| gcgaaggctg | ccgtcgaaga | gggcacgcgc | gccgggtggc | gcgtgggtct  | gctgcagtcg  | 1260 |
| gctcctgcgc | tggacgacct | cgccctgacg | ggcgacgagg | ccaccggtgc  | caacatcgtc  | 1320 |
| cgctgtggcg | tgctcggtcc | gctcaagcag | atcgccctca | acggcgccct  | ggagcccggc  | 1380 |
| gtcgttgccg | agaaggtgtc | caacctgccc | gcgggtcacg | gcctcaacgc  | cgcgaccggt  | 1440 |
| gagtacgagg | acctgctcaa | ggccggcgct | gccgaccggg | tgaaggtcac  | ccgctcggcg  | 1500 |
| ctgcagaacg | cggcgtccat | cgcggtctct | ttcctcacca | ccgaggccgt  | cgctcgccgac | 1560 |
| aagccggaga | aggcgtccgc | acccgcgggc | gaccgcgacc | gtggcatggg  | cggtatggac  | 1620 |
| ttctaa     |            |            |            |             |             | 1626 |

<210> 160  
 <211> 541  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 160

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Lys | Thr | Ile | Ala | Tyr | Asp | Glu | Glu | Ala | Arg | Arg | Gly | Leu | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Arg | Gly | Leu | Asn | Ala | Leu | Ala | Asp | Ala | Val | Lys | Val | Thr | Leu | Gly | Pro |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Lys | Gly | Arg | Asn | Val | Val | Leu | Glu | Lys | Lys | Trp | Gly | Ala | Pro | Thr | Ile |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Thr | Asn | Asp | Gly | Val | Ser | Ile | Ala | Lys | Glu | Ile | Glu | Leu | Glu | Asp | Pro |
|     |     |     | 50  |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Tyr | Glu | Lys | Ile | Gly | Ala | Glu | Leu | Val | Lys | Glu | Val | Ala | Lys | Lys | Thr |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Asp | Asp | Val | Ala | Gly | Asp | Gly | Thr | Thr | Thr | Ala | Thr | Val | Leu | Ala | Gln |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |
| Ala | Leu | Val | Arg | Glu | Gly | Leu | Arg | Asn | Val | Ala | Ala | Gly | Ala | Asn | Pro |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Gly | Leu | Lys | Arg | Gly | Ile | Glu | Lys | Ala | Val | Glu | Ala | Val | Thr | Gln |
|     |     |     | 115 |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ser | Leu | Leu | Lys | Ser | Ala | Lys | Glu | Val | Glu | Thr | Lys | Glu | Gln | Ile | Ser |
|     |     |     | 130 |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Ala | Thr | Ala | Ala | Ile | Ser | Ala | Gly | Asp | Thr | Gln | Ile | Gly | Glu | Leu | Ile |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |
| Ala | Glu | Ala | Met | Asp | Lys | Val | Gly | Asn | Glu | Gly | Val | Ile | Thr | Val | Glu |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |     |
| Glu | Ser | Asn | Thr | Phe | Gly | Leu | Gln | Leu | Glu | Leu | Thr | Glu | Gly | Met | Arg |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Phe | Asp | Lys | Gly | Tyr | Ile | Ser | Gly | Tyr | Phe | Val | Thr | Asp | Ala | Glu | Arg |
|     |     |     | 195 |     |     |     | 200 |     |     |     |     | 205 |     |     |     |



Gln Glu Ala Val Leu Glu Asp Pro Tyr Ile Leu Leu Val Ser Ser Lys  
 210 215 220  
 Val Ser Thr Val Lys Asp Leu Leu Pro Leu Leu Glu Lys Val Ile Gln  
 225 230 235 240  
 Ala Gly Lys Pro Leu Leu Ile Ile Ala Glu Asp Val Glu Gly Glu Ala  
 245 250 255  
 Leu Ser Thr Leu Val Val Asn Lys Ile Arg Gly Thr Phe Lys Ser Val  
 260 265 270  
 Ala Val Lys Ala Pro Gly Phe Gly Asp Arg Arg Lys Ala Met Leu Gln  
 275 280 285  
 Asp Met Ala Ile Leu Thr Gly Gly Gln Val Val Ser Glu Arg Val Gly  
 290 295 300  
 Leu Ser Leu Glu Thr Ala Asp Val Ser Leu Leu Gly Gln Ala Arg Lys  
 305 310 315 320  
 Val Val Val Thr Lys Asp Glu Thr Thr Ile Val Glu Gly Ser Gly Asp  
 325 330 335  
 Ser Asp Ala Ile Ala Gly Arg Val Ala Gln Ile Arg Ala Glu Ile Glu  
 340 345 350  
 Asn Ser Asp Ser Asp Tyr Asp Arg Glu Lys Leu Gln Glu Arg Leu Ala  
 355 360 365  
 Lys Leu Ala Gly Gly Val Ala Val Ile Lys Ala Gly Ala Ala Thr Glu  
 370 375 380  
 Val Glu Leu Lys Glu Arg Lys His Arg Ile Glu Asp Ala Val Arg Asn  
 385 390 395 400  
 Ala Lys Ala Ala Val Glu Glu Gly Ile Val Ala Gly Gly Gly Val Ala  
 405 410 415  
 Leu Leu Gln Ser Ala Pro Ala Leu Asp Asp Leu Gly Leu Thr Gly Asp  
 420 425 430  
 Glu Ala Thr Gly Ala Asn Ile Val Arg Val Ala Leu Ser Ala Pro Leu  
 435 440 445  
 Lys Gln Ile Ala Phe Asn Gly Gly Leu Glu Pro Gly Val Val Ala Glu  
 450 455 460  
 Lys Val Ser Asn Leu Pro Ala Gly His Gly Leu Asn Ala Ala Thr Gly  
 465 470 475 480  
 Glu Tyr Glu Asp Leu Lys Ala Gly Val Ala Asp Pro Val Lys Val  
 485 490 495  
 Thr Arg Ser Ala Leu Gln Asn Ala Ala Ser Ile Ala Ala Leu Phe Leu  
 500 505 510  
 Thr Thr Glu Ala Val Val Ala Asp Lys Pro Glu Lys Ala Ser Ala Pro  
 515 520 525  
 Ala Gly Asp Pro Thr Gly Gly Met Gly Gly Met Asp Phe  
 530 535 540

<210> 161

<211> 985

<212> DNA

<213> Mycobacterium vaccae

<400> 161

|  |     |
|--|-----|
| ggatccctac atcctgctgg tcagctccaa ggtgtcgacc gtcaaggatc tgctcccgtc  | 60  |
| gctggagaag gtcattccagg ccggcaagcc gctgctgac atcgccgagg acgtcgaggg  | 120 |
| cgaggccctg tccacgctgg tggtaacaa gatccgcggc accttcaagt ccgtcgccgt   | 180 |
| caaggtccg ggcttcggtg accgcccga ggcgatgctg caggacatgg ccatcctcac    | 240 |
| cggtggtcag gtcgtcagcg aaagagtcgg gctgtccctg gagaccgccc acgtctcgct  | 300 |
| gctggggccag gcccgcaagg tcgtcgtcac caaggacgag accaccatcg tcgagggctc | 360 |
| gggcgattcc gatgccatcg ccggccgggt ggctcagatc cgcgccgaga tcgagaacag  | 420 |
| cgactccgac tacgaccgcg agaagctgca ggagcgctg gccaaagctgg ccggcggtgt  | 480 |

|            |            |            |             |            |            |     |
|------------|------------|------------|-------------|------------|------------|-----|
| tgcggtgatc | aaggccggag | ctgccaccga | ggtggagctc  | aaggagcgca | agcaccgcat | 540 |
| cgaggacgcc | gtccgcaacg | cgaaggctgc | cgtcgaagag  | ggcatcgctc | ccggtggcgg | 600 |
| cgtggctctg | ctgcagtcgg | ctcctgcgct | ggacgacctc  | ggcctgacgg | gcgacgaggg | 660 |
| caccggtgcc | aacatcgctc | gcgtggcgct | gtcggctccg  | ctcaagcaga | tcgccttcaa | 720 |
| cggcggcctg | gagcccgcg  | tcgttgccga | gaaggtgtcc  | aacctgccc  | cgggtcacgg | 780 |
| cctcaacgcc | gcgaccggtg | agtacgagga | cctgctcaag  | gccggcgctc | ccgacccggt | 840 |
| gaaggtcacc | cgctcggcgc | tgcagaacgc | ggcgctccatc | gcggctctgt | tcctcaccac | 900 |
| cgaggccgtc | gtcgccgaca | agccggagaa | ggcgctccgca | cccgcggggc | acccgaccgg | 960 |
| tggcatgggc | ggtatggact | tctaa      |             |            |            | 985 |

<210> 162  
 <211> 327  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 162

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Pro | Tyr | Ile | Leu | Val | Ser | Ser | Lys | Val | Ser | Thr | Val | Lys | Asp |
| 1   |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Leu | Pro | Leu | Leu | Glu | Lys | Val | Ile | Gln | Ala | Gly | Lys | Pro | Leu |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  | Leu |
| Ile | Ile | Ala | Glu | Asp | Val | Glu | Gly | Glu | Ala | Leu | Ser | Thr | Leu | Val |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     | Val |
| Asn | Lys | Ile | Arg | Gly | Thr | Phe | Lys | Ser | Val | Ala | Val | Lys | Ala | Pro |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     | Gly |
| Phe | Gly | Asp | Arg | Arg | Lys | Ala | Met | Leu | Gln | Asp | Met | Ala | Ile | Leu |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |
| Gly | Gly | Gln | Val | Val | Ser | Glu | Arg | Val | Gly | Leu | Ser | Leu | Glu | Thr |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |
| Asp | Val | Ser | Leu | Leu | Gly | Gln | Ala | Arg | Lys | Val | Val | Val | Thr | Lys |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 | Asp |
| Glu | Thr | Thr | Ile | Val | Glu | Gly | Ser | Gly | Asp | Ser | Asp | Ala | Ile | Ala |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     | Gly |
| Arg | Val | Ala | Gln | Ile | Arg | Ala | Glu | Ile | Glu | Asn | Ser | Asp | Ser | Asp |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     | Tyr |
| Asp | Arg | Glu | Lys | Leu | Gln | Glu | Arg | Leu | Ala | Lys | Leu | Ala | Gly | Gly |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     | 160 |
| Ala | Val | Ile | Lys | Ala | Gly | Ala | Ala | Thr | Glu | Val | Glu | Leu | Lys | Glu |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |
| Lys | His | Arg | Ile | Glu | Asp | Ala | Val | Arg | Asn | Ala | Lys | Ala | Ala | Val |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 | Glu |
| Glu | Gly | Ile | Val | Ala | Gly | Gly | Gly | Val | Ala | Leu | Leu | Gln | Ser | Ala |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     | Pro |
| Ala | Leu | Asp | Asp | Leu | Gly | Leu | Thr | Gly | Asp | Glu | Ala | Thr | Gly | Ala |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     | Asn |
| Ile | Val | Arg | Val | Ala | Leu | Ser | Ala | Pro | Leu | Lys | Gln | Ile | Ala | Phe |
| 225 |     |     |     | 230 |     |     |     |     |     | 235 |     |     |     | 240 |
| Gly | Gly | Leu | Glu | Pro | Gly | Val | Val | Ala | Glu | Lys | Val | Ser | Asn | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |
| Ala | Gly | His | Gly | Leu | Asn | Ala | Ala | Thr | Gly | Glu | Tyr | Glu | Asp | Leu |
|     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 | Leu |
| Lys | Ala | Gly | Val | Ala | Asp | Pro | Val | Lys | Val | Thr | Arg | Ser | Ala | Leu |
|     | 275 |     |     |     |     | 280 |     |     |     |     |     | 285 |     | Gln |
| Asn | Ala | Ala | Ser | Ile | Ala | Ala | Leu | Phe | Leu | Thr | Thr | Glu | Ala | Val |
|     | 290 |     |     |     | 295 |     |     |     |     |     | 300 |     |     | Val |
| Ala | Asp | Lys | Pro | Glu | Lys | Ala | Ser | Ala | Pro | Ala | Gly | Asp | Pro | Thr |
| 305 |     |     |     | 310 |     |     |     |     |     | 315 |     |     |     | Gly |
| Gly | Met | Gly | Gly | Met | Asp | Phe |     |     |     |     |     |     |     |     |

10051643-011802

<210> 163  
 <211> 403  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 163

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| ggatccgcgg | caccggctgg | tgacgaccaa | gtacaacccg | gcccgcacct | ggacggccga | 60  |
| gaactccgtc | ggcatcggcg | gcgcgtacct | gtgcatctac | gggatggagg | gccccggcgg | 120 |
| ctatcagttc | gtcggccgca | ccacccaggt | gtggagtcgt | taccgccaca | cggcgccgtt | 180 |
| cgaacccgga | agtccctggc | tgctgcggtt | tttcgaccga | atttcgtggt | atccggtgtc | 240 |
| ggccgaggag | ctgctggaat | tgcgagccga | catggccgca | ggccggggct | cggtcgacat | 300 |
| caccgacggc | gtgttctccc | tcgccgagca | cgaacgggtt | ctggccgaca | acgccgacga | 360 |
| catcgccgcg | ttccgttccc | ggcaggcggc | cgcgttctcc | gcc        |            | 403 |

<210> 164  
 <211> 336  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 164

|            |            |            |             |            |            |     |
|------------|------------|------------|-------------|------------|------------|-----|
| cggaccgcgt | gggcggccgc | cggcgagttc | gaccgcgccc  | agaaagccgc | gtcgaaggcc | 60  |
| accgacgccg | ataccgggga | cctggtgctc | tacgacggtg  | cgagcgggtc | gacgtcccgt | 120 |
| tcgcgtcgag | cgtgtggaag | gtcgacgtcg | ccgtcgggtga | ccgggtggtg | gccggacagc | 180 |
| cgttgctggc | gctggaggcg | atgaagatgg | agaccgtgct  | gcgcgccccg | gccgacgggg | 240 |
| tggtcaccca | gatcctggtc | tcgctggggc | atctcgtcga  | tcccggcacc | ccactggtcg | 300 |
| tggtcggcac | cggagtgcgc | gcatgagcgc | cgtcga      |            |            | 336 |

<210> 165  
 <211> 134  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 165

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Pro | Arg | His | Arg | Leu | Val | Thr | Thr | Lys | Tyr | Asn | Pro | Ala | Arg | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Trp | Thr | Ala | Glu | Asn | Ser | Val | Gly | Ile | Gly | Gly | Ala | Tyr | Leu | Cys | Ile |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Tyr | Gly | Met | Glu | Gly | Pro | Gly | Gly | Tyr | Gln | Phe | Val | Gly | Arg | Thr | Thr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gln | Val | Trp | Ser | Arg | Tyr | Arg | His | Thr | Ala | Pro | Phe | Glu | Pro | Gly | Ser |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Trp | Leu | Leu | Arg | Phe | Phe | Asp | Arg | Ile | Ser | Trp | Tyr | Pro | Val | Ser |
| 65  |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |     |
| Ala | Glu | Glu | Leu | Leu | Glu | Leu | Arg | Ala | Asp | Met | Ala | Ala | Gly | Arg | Gly |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |
| Ser | Val | Asp | Ile | Thr | Asp | Gly | Val | Phe | Ser | Leu | Ala | Glu | His | Glu | Arg |
|     |     | 100 |     |     |     | 105 |     |     |     |     |     | 110 |     |     |     |
| Phe | Leu | Ala | Asp | Asn | Ala | Asp | Asp | Ile | Ala | Ala | Phe | Arg | Ser | Arg | Gln |
|     |     | 115 |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Ala | Ala | Ala | Phe | Ser | Ala |     |     |     |     |     |     |     |     |     |     |
| 130 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 166  
 <211> 108  
 <212> PRT

10051643-011802

<213> Mycobacterium vaccae

<400> 166

Arg Thr Ala Trp Ala Ala Ala Gly Glu Phe Asp Arg Ala Glu Lys Ala  
1 5 10 15  
Ala Ser Lys Ala Thr Asp Ala Asp Thr Gly Asp Leu Val Leu Tyr Asp  
20 25 30  
Gly Asp Glu Arg Val Asp Ala Pro Phe Ala Ser Ser Val Trp Lys Val  
35 40 45  
Asp Val Ala Val Gly Asp Arg Val Val Ala Gly Gln Pro Leu Leu Ala  
50 55 60  
Leu Glu Ala Met Lys Met Glu Thr Val Leu Arg Ala Pro Ala Asp Gly  
65 70 75 80  
Val Val Thr Gln Ile Leu Val Ser Ala Gly His Leu Val Asp Pro Gly  
85 90 95  
Thr Pro Leu Val Val Val Gly Thr Gly Val Arg Ala  
100 105

<210> 167

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 167

atagaattcg tccgacagtg ggacctcgag c

31

<210> 168

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 168

atagaattcc caccgcggtca gccgccc

27

<210> 169

<211> 1111

<212> DNA

<213> Mycobacterium vaccae

<400> 169

gtccgacagt gggacctcga gcaccacgtc acaggacagc ggccccgcca gcggcgccct 60  
gcggtctcc aactggccgc tctatatggc cgacggtttc atcgacagct tccagaccgc 120  
ctcgggcac acggtcgact acaaagaaga cttcaacgac aacgagcagt ggttcgccaa 180  
ggtcaaggag ccgttgctgc gcaagcagga cataggcgcc gacctggtga tccccaccga 240  
gttcattggc gcgcgcgtca agggcctggg atgggtcaat gagatcagcg aagccggcgt 300  
gcccaatcgc aagaatctgc gtcaggacct gttggactcg agcatcgacg agggccgcaa 360  
gttcaccgcg ccgtacatga ccggcatggt cgggtctcgc tacaacaagg cagccaccgg 420  
acgcgatatc cgcaccatcg acgacctctg ggatcccgcg ttcaagggcc gcgtcagtct 480  
gttctccgac gtccaggagc gcctcggcat gatcatgtc tcgcagggca actcgccgga 540  
gaatccgacc accgagttca ttcagcaggg ggtcgatctg gtccgcgaac agaacgacag 600  
ggggtcagat ccgtcgcttc accggcaacg actacgccga cgacctggcc gcagaaacat 660

cgccatcgcg caggcggtact ccggtgacgt cgtgcagctg caggcggaca accccgatct 720  
gcagttcatc gttcccgaat ccggcggcga ctggttcgtc gacacgatgg tgatcccgta 780  
caccacgcag aaccagaagg ccgccgaggc gtggatcgac tacatctacg accgagccaa 840  
ctacgccaag ctggtcgcgt tcacccagtt cgtgcccgcga ctctcggaca tgaccgacga 900  
actcgccaag gtcgattcctg catcggcgga gaacccgctg atcaaccctg cggccgaggt 960  
gcaggcgaac ctgaagtcgt gggcggcact gaccgacgag cagacgcagg agttcaacac 1020  
tgcgtacgcc gccgtcaccg gcggctgacg cgggtggtagt gccgatgcga ggggcataaa 1080  
tggccctgcg gacgcgagga gcataaatgg c 1111

<210> 170

<211> 348

<212> PRT

<213> Mycobacterium vaccae

<400> 170

Ser Asp Ser Gly Thr Ser Ser Thr Thr Ser Gln Asp Ser Gly Pro Ala  
1 5 10 15  
Ser Gly Ala Leu Arg Val Ser Asn Trp Pro Leu Tyr Met Ala Asp Gly  
20 25 30  
Phe Ile Ala Ala Phe Gln Thr Ala Ser Gly Ile Thr Val Asp Tyr Lys  
35 40 45  
Glu Asp Phe Asn Asp Asn Glu Gln Trp Phe Ala Lys Val Lys Glu Pro  
50 55 60  
Leu Ser Arg Lys Gln Asp Ile Gly Ala Asp Leu Val Ile Pro Thr Glu  
65 70 75 80  
Phe Met Ala Ala Arg Val Lys Gly Leu Gly Trp Leu Asn Glu Ile Ser  
85 90 95  
Glu Ala Gly Val Pro Asn Arg Lys Asn Leu Arg Gln Asp Leu Leu Asp  
100 105 110  
Ser Ser Ile Asp Glu Gly Arg Lys Phe Thr Ala Pro Tyr Met Thr Gly  
115 120 125  
Met Val Gly Leu Ala Tyr Asn Lys Ala Ala Thr Gly Arg Asp Ile Arg  
130 135 140  
Thr Ile Asp Asp Leu Trp Asp Pro Ala Phe Lys Gly Arg Val Ser Leu  
145 150 155 160  
Phe Ser Asp Val Gln Asp Gly Leu Gly Met Ile Met Leu Ser Gln Gly  
165 170 175  
Asn Ser Pro Glu Asn Pro Thr Thr Glu Ser Ile Gln Gln Ala Val Asp  
180 185 190  
Leu Val Arg Glu Gln Asn Asp Arg Gly Gln Ile Arg Arg Phe Thr Gly  
195 200 205  
Asn Asp Tyr Ala Asp Asp Leu Ala Ala Gly Asn Ile Ala Ile Ala Gln  
210 215 220  
Ala Tyr Ser Gly Asp Val Val Gln Leu Gln Ala Asp Asn Pro Asp Leu  
225 230 235 240  
Gln Phe Ile Val Pro Glu Ser Gly Gly Asp Trp Phe Val Asp Thr Met  
245 250 255  
Val Ile Pro Tyr Thr Thr Gln Asn Gln Lys Ala Ala Glu Ala Trp Ile  
260 265 270  
Asp Tyr Ile Tyr Asp Arg Ala Asn Tyr Ala Lys Leu Val Ala Phe Thr  
275 280 285  
Gln Phe Val Pro Ala Leu Ser Asp Met Thr Asp Glu Leu Ala Lys Val  
290 295 300  
Asp Pro Ala Ser Ala Glu Asn Pro Leu Ile Asn Pro Ser Ala Glu Val  
305 310 315 320  
Gln Ala Asn Leu Lys Ser Trp Ala Ala Leu Thr Asp Glu Gln Thr Gln  
325 330 335

10051643.011302

Glu Phe Asn Thr Ala Tyr Ala Ala Val Thr Gly Gly  
340 345

<210> 171  
<211> 1420  
<212> DNA  
<213> Mycobacterium vaccae

<220>  
<221> unsure  
<222> (955)...(955)

<221> unsure  
<222> (973)...(973)

<400> 171

|            |            |            |            |            |            |      |
|------------|------------|------------|------------|------------|------------|------|
| gatgagcagc | gtgctgaact | cgacctggtt | ggcctgggcc | gtcgcggtcg | cggtcgggtt | 60   |
| cccggtgctg | ctggtcgtgc | tgaccgaggt | gcacaacgcg | ttgcgtcggc | gcggcagcgc | 120  |
| gctggccccg | ccggtgcaac | tcttgcgtac | ctacatcctg | ccgctggggc | cgttgctgct | 180  |
| cctgctggta | caggcgatgg | agatctccga | cgacgccacg | tcggtagcgt | tggtcgccac | 240  |
| cctgttcggc | gtcgtgttgt | tgacgttggt | gctgtccggg | ctcaacgcc  | ccctcatcca | 300  |
| gggcgcacca | gaagacagct | ggcgcaggcg | gattccgtcg | atcttcctcg | acgtcgcgcg | 360  |
| cttcgcgctg | atcgcggtcg | gtatcacctg | gatcatggcc | tatgtctggg | gcgcgaacgt | 420  |
| ggggggcctg | ttcaccgcac | tgggcgtcac | ttccatcggt | cttggcctgg | ctctgcagaa | 480  |
| ttcggtcggt | cagatcatct | cggtgtctgt | gctgctgttc | gagcaaccgt | tccggctcgg | 540  |
| cgactggatc | accgtcccca | ccgcggcggg | ccggccgtcc | gccacaggcc | gcgtggtgga | 600  |
| agtcaactgg | cgtgcaacac | atatcgacac | cggcggcaac | ctgctggtaa | tgcccaacgc | 660  |
| cgaactcgcc | ggcgcgtcgt | tcaccaatta | cagccggccc | gtgggagagc | accggctgac | 720  |
| cgctgtcacc | accttcaacg | ccgcggacac | ccccgatgat | gtctgcgaga | tgctgtcgtc | 780  |
| ggtcgcggcg | tcgctgcccc | aactgcgcac | cgacggacag | atcgccacgc | tctatctcgg | 840  |
| tgcggccgaa | tacgagaagt | cgatcccgtt | gcacacaccc | gcggtggacg | actcggtcag | 900  |
| gagcacgtac | ctgcgatggg | tctggtacgc | cgcgcgcggg | caggaacttc | gcctnaacgg | 960  |
| cgctgccgac | ganttcgaca | cgccggaacg | gatcgccctc | gccatgcggg | ctgtggcgtc | 1020 |
| cacactgcgc | ttggcagacg | acgaacagca | ggagatcgcc | gacgtggtgc | gtctggtccg | 1080 |
| ttacggcaac | ggggaacgcc | tccagcagcc | gggtcaggta | ccgaccggga | tgaggttcat | 1140 |
| cgtagacggc | agggtgagtc | tgtccgtgat | cgatcaggac | ggcgacgtga | tcccggcgcg | 1200 |
| ggtgctcgag | cgtggcgact | tcctggggca | gaccacgctg | acgcgggaac | cggtactggc | 1260 |
| gaccgcgcac | gcgctggagg | aagtcaccgt | gctggagatg | gcccgtagcg | agatcgagcg | 1320 |
| cctggtgcac | cgaaagccga | tcctgctgca | cgtgatcggg | gccgtgatcg | ccgaccggcg | 1380 |
| cgcgcacgaa | cttcggttga | tggcggactc | gcaggactga |            |            | 1420 |

<210> 172  
<211> 471  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (318)...(318)

<221> UNSURE  
<222> (324)...(324)

<400> 172

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Ser | Val | Leu | Asn | Ser | Thr | Trp | Leu | Ala | Trp | Ala | Val | Ala | Val |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Ala | Val | Gly | Phe | Pro | Val | Leu | Leu | Val | Val | Leu | Thr | Glu | Val | His | Asn |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
|     |     |     | 20  |     |     |     |     |     |     | 25  |     |     |     |     |     |     | 30  |  |  |
| Ala | Leu | Arg | Arg | Arg | Gly | Ser | Ala | Leu | Ala | Arg | Pro | Val | Gln | Leu | Leu |     |     |  |  |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |     |  |  |
| Arg | Thr | Tyr | Ile | Leu | Pro | Leu | Gly | Ala | Leu | Leu | Leu | Leu | Leu | Val | Gln | Leu | Leu |  |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |     |  |  |
| Ala | Met | Glu | Ile | Ser | Asp | Asp | Ala | Thr | Ser | Val | Arg | Leu | Val | Ala | Thr |     |     |  |  |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |     |  |  |
| Leu | Phe | Gly | Val | Val | Leu | Leu | Thr | Leu | Val | Leu | Ser | Gly | Leu | Asn | Ala |     |     |  |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |     |  |  |
| Thr | Leu | Ile | Gln | Gly | Ala | Pro | Glu | Asp | Ser | Trp | Arg | Arg | Arg | Ile | Pro |     |     |  |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |     |  |  |
| Ser | Ile | Phe | Leu | Asp | Val | Ala | Arg | Phe | Ala | Leu | Ile | Ala | Val | Gly | Ile |     |     |  |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |     |  |  |
| Thr | Val | Ile | Met | Ala | Tyr | Val | Trp | Gly | Ala | Asn | Val | Gly | Gly | Leu | Phe |     |     |  |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |     |  |  |
| Thr | Ala | Leu | Gly | Val | Thr | Ser | Ile | Val | Leu | Gly | Leu | Ala | Leu | Gln | Asn |     |     |  |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |     |     |  |  |
| Ser | Val | Gly | Gln | Ile | Ile | Ser | Gly | Leu | Leu | Leu | Leu | Phe | Glu | Gln | Pro |     |     |  |  |
|     |     |     |     | 165 |     |     |     |     |     | 170 |     |     |     | 175 |     |     |     |  |  |
| Phe | Arg | Leu | Gly | Asp | Trp | Ile | Thr | Val | Pro | Thr | Ala | Ala | Gly | Arg | Pro |     |     |  |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     |  |  |
| Ser | Ala | His | Gly | Arg | Val | Val | Glu | Val | Asn | Trp | Arg | Ala | Thr | His | Ile |     |     |  |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     |     |  |  |
| Asp | Thr | Gly | Gly | Asn | Leu | Leu | Val | Met | Pro | Asn | Ala | Glu | Leu | Ala | Gly |     |     |  |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |     |     |  |  |
| Ala | Ser | Phe | Thr | Asn | Tyr | Ser | Arg | Pro | Val | Gly | Glu | His | Arg | Leu | Thr |     |     |  |  |
| 225 |     |     |     | 230 |     |     |     |     |     | 235 |     |     |     | 240 |     |     |     |  |  |
| Val | Val | Thr | Thr | Phe | Asn | Ala | Ala | Asp | Thr | Pro | Asp | Asp | Val | Cys | Glu |     |     |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |     |  |  |
| Met | Leu | Ser | Ser | Val | Ala | Ala | Ser | Leu | Pro | Glu | Leu | Arg | Thr | Asp | Gly |     |     |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |     |  |  |
| Gln | Ile | Ala | Thr | Leu | Tyr | Leu | Gly | Ala | Ala | Glu | Tyr | Glu | Lys | Ser | Ile |     |     |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |     |  |  |
| Pro | Leu | His | Thr | Pro | Ala | Val | Asp | Asp | Ser | Val | Arg | Ser | Thr | Tyr | Leu |     |     |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |     |     |  |  |
| Arg | Trp | Val | Trp | Tyr | Ala | Ala | Arg | Arg | Gln | Glu | Leu | Arg | Xaa | Asn | Gly |     |     |  |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     | 320 |     |     |     |  |  |
| Val | Ala | Asp | Xaa | Phe | Asp | Thr | Pro | Glu | Arg | Ile | Ala | Ser | Ala | Met | Arg |     |     |  |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     | 335 |     |     |     |     |  |  |
| Ala | Val | Ala | Ser | Thr |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |

<210> 173  
 <211> 2172  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 173

|             |             |              |             |             |             |      |
|-------------|-------------|--------------|-------------|-------------|-------------|------|
| tagatgacaa  | ttctgcccctg | gaatgcgcga   | acgtctgaac  | acccgacgcg  | aaaaagacgc  | 60   |
| gggcgctacc  | acctcctgtc  | gcggatgagc   | atccagtcca  | agttgctgct  | gatgctgctt  | 120  |
| ctgaccagca  | ttctctcggc  | tgcggtgggtc  | ggtttccatcg | gctatcagtc  | cggacgggtcc | 180  |
| tcgctgcgcg  | catcggtggt  | cgaccgcctc   | accgacatcc  | gcgagtcgca  | gtcgcgcggg  | 240  |
| ttggagaatc  | agttcgcgga  | cctgaagaac   | tcgatgggtga | tttactcgcg  | cggcagcact  | 300  |
| gccacggagg  | cgatcggcgc  | gttcagcgcg   | ggtttccgtc  | agctcggcga  | tgcgacgatc  | 360  |
| aataccgggc  | aggcggcgctc | attgcgcctg   | tactacgacc  | ggacgttcgc  | caacaccacc  | 420  |
| ctcgacgaca  | gcggaacccg  | cgtcgacgctc  | cgcgcgctca  | tcccgaatc   | caacccccag  | 480  |
| cgctatctgc  | aggcgctcta  | taccccgccg   | tttcagaact  | gggagaaggc  | gatcgcgttc  | 540  |
| gacgacgcgc  | gcgacggcag  | cgccctggctg  | gcccgaatg   | ccagattcaa  | cgagttcttc  | 600  |
| cgcgagatcg  | tgcaccgctt  | caacttcgag   | gatctgatgc  | tgctcgacct  | cgagggcaac  | 660  |
| gtggtgtact  | ccgcctacaa  | ggggccggat   | ctcgggacaa  | acatcgtcaa  | cggccccctat | 720  |
| cgcaaccggg  | aactgtcggg  | agcctacgag   | aaggcggctg  | cgtcgaactc  | gatcgactat  | 780  |
| gtcgggtgtca | ccgacttcgg  | gtggtacctg   | cctgccgagg  | aaccgaccgc  | ctggttctctg | 840  |
| tccccggctg  | gggtgaagga  | ccgagtcgac   | gggtgtgatg  | cgggtccagt  | cccgatcgcg  | 900  |
| cggatcaacg  | aattgatgac  | ggcgcgggga   | cagtggcgtg  | acaccgggat  | gggagacacc  | 960  |
| ggtgagacca  | tcctggtcgg  | accggacaat   | ctgatgcgct  | cggactcccg  | gctgttccgc  | 1020 |
| gagaaccggg  | agaagttcct  | ggccgacgct   | gtcgaggggg  | gaaccccgcg  | ggaggtcgcc  | 1080 |
| gacgaatcgg  | tgaccgccc   | cggcaccacg   | ctggtgcagc  | cggtgaccac  | ccgctccgct  | 1140 |
| gaggaggccc  | aacgcggcaa  | caccgggacg   | acgatcgagg  | acgactatct  | cggccacgag  | 1200 |
| gcgttacagg  | cgtaactcacc | ggtggacctg   | ccgggactgc  | actgggtgat  | cgtggccaag  | 1260 |
| atcgacaccg  | acgaggcggt  | cgccccgggtg  | gcgcagttca  | ccaggaccct  | ggtgctgtcg  | 1320 |
| acggtgatca  | tcatcttcgg  | cgtgtcgcgtg  | gcggccatgc  | tgctggcgcg  | gttggttcgtc | 1380 |
| cgtccgatcc  | ggcggttgca  | ggccggcgcc   | cagcagatca  | gcggcggtga  | ctaccgcctc  | 1440 |
| gctctgccgg  | tgttgctctg  | tgacgaattc   | ggcgatctga  | caacagcttt  | caacgacatg  | 1500 |
| agtcgcaatc  | tgtcgatcaa  | ggacgagctg   | ctcggcgagg  | agcgcgccga  | gaaccaacgg  | 1560 |
| ctgatgctgt  | ccctgatgcc  | cgaaccgggtg  | atgcagcgct  | acctcgacgg  | ggaggagacg  | 1620 |
| atcgcccagg  | accacaagaa  | cgtaaccgggtg | atcttcgcgc  | acatgatggg  | cctcgacgag  | 1680 |
| ttgtcgcgca  | tgttgacctc  | cgaggaaactg  | atggtgggtg  | tcaacgacct  | gaccgccag   | 1740 |
| ttcgacgcgc  | cgcccgagag  | tctcggggtc   | gaccacgtgc  | ggacgctgca  | cgacgggtac  | 1800 |
| ctggccagct  | gcgggttagg  | cgtgccgcgg   | ctggacaacg  | tccggcgcac  | ggtcaatttc  | 1860 |
| gcgatcga    | tggaccgcat  | catcgaccgg   | cacgcgcgcg  | agtccgggca  | cgacctgcgg  | 1920 |
| ctccgcgcgg  | gcacgcgacac | cgggtcggcg   | gccagcgggc  | tgggtggggcg | gtccacgttg  | 1980 |
| gcgtacgaca  | tgtgggggttc | ggcggtcgat   | gtcgctaacc  | aggtgcagcg  | cggctcccc   | 2040 |
| cagcccgga   | tctacgtcac  | ctcgcgggtg   | cacgaggtca  | tgcaggaaac  | tctcgacttc  | 2100 |
| gtcgcgcgcg  | gggaggtcgt  | cggcgagcgc   | ggcgtcgaga  | cggctcggcg  | ggtgcagggc  | 2160 |
| caccggcgat  | ga          |              |             |             |             | 2172 |

<210> 174  
 <211> 722  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 174

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Thr | Ile | Leu | Pro | Trp | Asn | Ala | Arg | Thr | Ser | Glu | His | Pro | Thr | Arg |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Lys | Arg | Arg | Gly | Arg | Tyr | His | Leu | Leu | Ser | Arg | Met | Ser | Ile | Gln | Ser |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     |     | 30  |     |     |
| Lys | Leu | Leu | Leu | Met | Leu | Leu | Leu | Thr | Ser | Ile | Leu | Ser | Ala | Ala | Val |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     |     | 45  |     |     |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Gly | Phe | Ile | Gly | Tyr | Gln | Ser | Gly | Arg | Ser | Ser | Leu | Arg | Ala | Ser | 50  | 55  | 60  |
| Val | Phe | Asp | Arg | Leu | Thr | Asp | Ile | Arg | Glu | Ser | Gln | Ser | Arg | Gly | Leu | 65  | 70  | 75  |
| Glu | Asn | Gln | Phe | Ala | Asp | Leu | Lys | Asn | Ser | Met | Val | Ile | Tyr | Ser | Arg | 85  | 90  | 95  |
| Gly | Ser | Thr | Ala | Thr | Glu | Ala | Ile | Gly | Ala | Phe | Ser | Asp | Gly | Phe | Arg | 100 | 105 | 110 |
| Gln | Leu | Gly | Asp | Ala | Thr | Ile | Asn | Thr | Gly | Gln | Ala | Ala | Ser | Leu | Arg | 115 | 120 | 125 |
| Arg | Tyr | Tyr | Asp | Arg | Thr | Phe | Ala | Asn | Thr | Thr | Leu | Asp | Asp | Ser | Gly | 130 | 135 | 140 |
| Asn | Arg | Val | Asp | Val | Arg | Ala | Leu | Ile | Pro | Lys | Ser | Asn | Pro | Gln | Arg | 145 | 150 | 155 |
| Tyr | Leu | Gln | Ala | Leu | Tyr | Thr | Pro | Pro | Phe | Gln | Asn | Trp | Glu | Lys | Ala | 165 | 170 | 175 |
| Ile | Ala | Phe | Asp | Asp | Ala | Arg | Asp | Gly | Ser | Ala | Trp | Ser | Ala | Ala | Asn | 180 | 185 | 190 |
| Ala | Arg | Phe | Asn | Glu | Phe | Phe | Arg | Glu | Ile | Val | His | Arg | Phe | Asn | Phe | 195 | 200 | 205 |
| Glu | Asp | Leu | Met | Leu | Leu | Asp | Leu | Glu | Gly | Asn | Val | Val | Tyr | Ser | Ala | 210 | 215 | 220 |
| Tyr | Lys | Gly | Pro | Asp | Leu | Gly | Thr | Asn | Ile | Val | Asn | Gly | Pro | Tyr | Arg | 225 | 230 | 235 |
| Asn | Arg | Glu | Leu | Ser | Glu | Ala | Tyr | Glu | Lys | Ala | Val | Ala | Ser | Asn | Ser | 245 | 250 | 255 |
| Ile | Asp | Tyr | Val | Gly | Val | Thr | Asp | Phe | Gly | Trp | Tyr | Leu | Pro | Ala | Glu | 260 | 265 | 270 |
| Glu | Pro | Thr | Ala | Trp | Phe | Leu | Ser | Pro | Val | Gly | Leu | Lys | Asp | Arg | Val | 275 | 280 | 285 |
| Asp | Gly | Val | Met | Ala | Val | Gln | Phe | Pro | Ile | Ala | Arg | Ile | Asn | Glu | Leu | 290 | 295 | 300 |
| Met | Thr | Ala | Arg | Gly | Gln | Trp | Arg | Asp | Thr | Gly | Met | Gly | Asp | Thr | Gly | 305 | 310 | 315 |
| Glu | Thr | Ile | Leu | Val | Gly | Pro | Asp | Asn | Leu | Met | Arg | Ser | Asp | Ser | Arg | 325 | 330 | 335 |
| Leu | Phe | Arg | Glu | Asn | Arg | Glu | Lys | Phe | Leu | Ala | Asp | Val | Val | Glu | Gly | 340 | 345 | 350 |
| Gly | Thr | Pro | Pro | Glu | Val | Ala | Asp | Glu | Ser | Val | Asp | Arg | Arg | Gly | Thr | 355 | 360 | 365 |
| Thr | Leu | Val | Gln | Pro | Val | Thr | Thr | Arg | Ser | Val | Glu | Glu | Ala | Gln | Arg | 370 | 375 | 380 |
| Gly | Asn | Thr | Gly | Thr | Thr | Ile | Glu | Asp | Asp | Tyr | Leu | Gly | His | Glu | Ala | 385 | 390 | 395 |
| Leu | Gln | Ala | Tyr | Ser | Pro | Val | Asp | Leu | Pro | Gly | Leu | His | Trp | Val | Ile | 405 | 410 | 415 |
| Val | Ala | Lys | Ile | Asp | Thr | Asp | Glu | Ala | Phe | Ala | Pro | Val | Ala | Gln | Phe | 420 | 425 | 430 |
| Thr | Arg | Thr | Leu | Val | Leu | Ser | Thr | Val | Ile | Ile | Ile | Phe | Gly | Val | Ser | 435 | 440 | 445 |
| Leu | Ala | Ala | Met | Leu | Leu | Ala | Arg | Leu | Phe | Val | Arg | Pro | Ile | Arg | Arg | 450 | 455 | 460 |
| Leu | Gln | Ala | Gly | Ala | Gln | Gln | Ile | Ser | Gly | Gly | Asp | Tyr | Arg | Leu | Ala | 465 | 470 | 475 |
| Leu | Pro | Val | Leu | Ser | Arg | Asp | Glu | Phe | Gly | Asp | Leu | Thr | Thr | Ala | Phe | 485 | 490 | 495 |
| Asn | Asp | Met | Ser | Arg | Asn | Leu | Ser | Ile | Lys | Asp | Glu | Leu | Leu | Gly | Glu |     |     |     |



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<400> 176
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cgcgagtcgc agtcgcgcgc gttggagaat cagttcgcgc acctgaagaa ctcgatgggtg      120
atttactcgc gcggcagcac tgccacggag gcgatcggcg cgttcagcga cggtttccgt      180
cagctcggcg atgcgacgat caataccggg caggcggcgt cattgcgccg ttactacgac      240
cggacgttcg ccaacaccac cctcgacgac agcggaaacc gcgtcgacgt ccgcgcgctc      300
atccccgaaat ccaacccccca gcgctatctg caggcgctct ataccgccgc gtttcagaac      360
tgggagaagg cgatcgcggt cgacgacgcg cgcgacggca gcgcctggtc ggccgccaat      420
gccagattca acgagttctt ccgcgagatc gtgcaccgct tcaacttcga ggatctgatg      480
ctgctcgacc tcgagggcaa cgtggtgtac tccgcctaca aggggccgga tctcgggaca      540
aacatcgtca acggccccta tcgcaaccgg gaactgtcgg aagcctacga gaaggcggtc      600
gcgtcgaact cgatcgacta tgcggtgtc accgacttcg ggtggtacct gcctgccgag      660
gaaccgaccg cctggttctt gtccccggtc ggggtgaagg accgagtcga cgggtgtgatg      720
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gacaccggga tgggagacac cggtgagacc atcctggtcg gaccggacaa tctgatgcgc      840
tcggactccc ggctgttccg cgagaaccgg gagaagtcc tggccgacgt cgtcgagggg      900
ggaaccccg cggaggtcgc cgacgaatcg gttgaccgcc gcggcaccac gctggtgcag      960
ccggtgacca cccgctccgt cgaggaggcc caacgcggca acaccgggac gacgatcgag     1020
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cactgggtga tcgtggccaa gatcgacacc gacgaggcgt tcgccccggt ggcgagttc     1140
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ctggtggggc ggtccacgtt ggcgtagcac atgtgggggt cggcggtcga tgtcgtaac     1860
caggtgcagc gcggctcccc ccagccccgc atctacgtca cctcgcgggt gcacgaggtc     1920
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<210> 177
<211> 297
<212> PRT
<213> Mycobacterium vaccae

```

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<220>
<221> UNSURE
<222> (145)...(145)

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<221> UNSURE
<222> (151)...(151)

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<400> 177
Glu Gln Pro Phe Arg Leu Gly Asp Trp Ile Thr Val Pro Thr Ala Ala
 1             5             10             15
Gly Arg Pro Ser Ala His Gly Arg Val Val Glu Val Asn Trp Arg Ala
          20          25          30
Thr His Ile Asp Thr Gly Gly Asn Leu Leu Val Met Pro Asn Ala Glu
        35        40        45
Leu Ala Gly Ala Ser Phe Thr Asn Tyr Ser Arg Pro Val Gly Glu His
    50          55          60

```

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Leu | Thr | Val | Val | Thr | Thr | Phe | Asn | Ala | Ala | Asp | Thr | Pro | Asp | Asp |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Val | Cys | Glu | Met | Leu | Ser | Ser | Val | Ala | Ala | Ser | Leu | Pro | Glu | Leu | Arg |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Thr | Asp | Gly | Gln | Ile | Ala | Thr | Leu | Tyr | Leu | Gly | Ala | Ala | Glu | Tyr | Glu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Lys | Ser | Ile | Pro | Leu | His | Thr | Pro | Ala | Val | Asp | Asp | Ser | Val | Arg | Ser |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr | Tyr | Leu | Arg | Trp | Val | Trp | Tyr | Ala | Ala | Arg | Arg | Gln | Glu | Leu | Arg |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Xaa | Asn | Gly | Val | Ala | Asp | Xaa | Phe | Asp | Thr | Pro | Glu | Arg | Ile | Ala | Ser |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Ala | Met | Arg | Ala | Val | Ala | Ser | Thr | Leu | Arg | Leu | Ala | Asp | Asp | Glu | Gln |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gln | Glu | Ile | Ala | Asp | Val | Val | Arg | Leu | Val | Arg | Tyr | Gly | Asn | Gly | Glu |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Arg | Leu | Gln | Gln | Pro | Gly | Gln | Val | Pro | Thr | Gly | Met | Arg | Phe | Ile | Val |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Asp | Gly | Arg | Val | Ser | Leu | Ser | Val | Ile | Asp | Gln | Asp | Gly | Asp | Val | Ile |
|     |     | 210 |     |     |     | 215 |     |     |     | 220 |     |     |     |     |     |
| Pro | Ala | Arg | Val | Leu | Glu | Arg | Gly | Asp | Phe | Leu | Gly | Gln | Thr | Thr | Leu |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Thr | Arg | Glu | Pro | Val | Leu | Ala | Thr | Ala | His | Ala | Leu | Glu | Glu | Val | Thr |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Leu | Glu | Met | Ala | Arg | Asp | Glu | Ile | Glu | Arg | Leu | Val | His | Arg | Lys |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Pro | Ile | Leu | Leu | His | Val | Ile | Gly | Ala | Val | Ala | Asp | Arg | Arg | Ala | His |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Glu | Leu | Arg | Leu | Met | Asp | Ser | Gln | Asp |     |     |     |     |     |     |     |
|     |     | 290 |     |     |     | 295 |     |     |     |     |     |     |     |     |     |

<210> 178

<211> 670

<212> PRT

<213> Mycobacterium vaccae

<400> 178

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Tyr | Gln | Ser | Gly | Arg | Ser | Ser | Leu | Arg | Ala | Ser | Val | Phe | Asp | Arg |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Thr | Asp | Ile | Arg | Glu | Ser | Gln | Ser | Arg | Gly | Leu | Glu | Asn | Gln | Phe |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Asp | Leu | Lys | Asn | Ser | Met | Val | Ile | Tyr | Ser | Arg | Gly | Ser | Thr | Ala |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Thr | Glu | Ala | Ile | Gly | Ala | Phe | Ser | Asp | Gly | Phe | Arg | Gln | Leu | Gly | Asp |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ala | Thr | Ile | Asn | Thr | Gly | Gln | Ala | Ala | Ser | Leu | Arg | Arg | Tyr | Tyr | Asp |
| 65  |     |     |     | 70  |     |     |     |     |     | 75  |     |     |     |     | 80  |
| Arg | Thr | Phe | Ala | Asn | Thr | Thr | Leu | Asp | Asp | Ser | Gly | Asn | Arg | Val | Asp |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Val | Arg | Ala | Leu | Ile | Pro | Lys | Ser | Asn | Pro | Gln | Arg | Tyr | Leu | Gln | Ala |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Tyr | Thr | Pro | Pro | Phe | Gln | Asn | Trp | Glu | Lys | Ala | Ile | Ala | Phe | Asp |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Asp | Ala | Arg | Asp | Gly | Ser | Ala | Trp | Ser | Ala | Ala | Asn | Ala | Arg | Phe | Asn |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Glu | Phe | Phe | Arg | Glu | Ile | Val | His | Arg | Phe | Asn | Phe | Glu | Asp | Leu | Met |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Leu | Asp | Leu | Glu | Gly | Asn | Val | Val | Tyr | Ser | Ala | Tyr | Lys | Gly | Pro |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Asp | Leu | Gly | Thr | Asn | Ile | Val | Asn | Gly | Pro | Tyr | Arg | Asn | Arg | Glu | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ser | Glu | Ala | Tyr | Glu | Lys | Ala | Val | Ala | Ser | Asn | Ser | Ile | Asp | Tyr | Val |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Gly | Val | Thr | Asp | Phe | Gly | Trp | Tyr | Leu | Pro | Ala | Glu | Glu | Pro | Thr | Ala |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Trp | Phe | Leu | Ser | Pro | Val | Gly | Leu | Lys | Asp | Arg | Val | Asp | Gly | Val | Met |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ala | Val | Gln | Phe | Pro | Ile | Ala | Arg | Ile | Asn | Glu | Leu | Met | Thr | Ala | Arg |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Gly | Gln | Trp | Arg | Asp | Thr | Gly | Met | Gly | Asp | Thr | Gly | Glu | Thr | Ile | Leu |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Val | Gly | Pro | Asp | Asn | Leu | Met | Arg | Ser | Asp | Ser | Arg | Leu | Phe | Arg | Glu |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Asn | Arg | Glu | Lys | Phe | Leu | Ala | Asp | Val | Val | Glu | Gly | Gly | Thr | Pro | Pro |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Glu | Val | Ala | Asp | Glu | Ser | Val | Asp | Arg | Arg | Gly | Thr | Thr | Leu | Val | Gln |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Pro | Val | Thr | Thr | Arg | Ser | Val | Glu | Glu | Ala | Gln | Arg | Gly | Asn | Thr | Gly |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Thr | Thr | Ile | Glu | Asp | Asp | Tyr | Leu | Gly | His | Glu | Ala | Leu | Gln | Ala | Tyr |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Ser | Pro | Val | Asp | Leu | Pro | Gly | Leu | His | Trp | Val | Ile | Val | Ala | Lys | Ile |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Asp | Thr | Asp | Glu | Ala | Phe | Ala | Pro | Val | Ala | Gln | Phe | Thr | Arg | Thr | Leu |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Val | Leu | Ser | Thr | Val | Ile | Ile | Ile | Phe | Gly | Val | Ser | Leu | Ala | Ala | Met |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Leu | Leu | Ala | Arg | Leu | Phe | Val | Arg | Pro | Ile | Arg | Arg | Leu | Gln | Ala | Gly |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Ala | Gln | Gln | Ile | Ser | Gly | Gly | Asp | Tyr | Arg | Leu | Ala | Leu | Pro | Val | Leu |
|     |     | 420 |     |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Ser | Arg | Asp | Glu | Phe | Gly | Asp | Leu | Thr | Thr | Ala | Phe | Asn | Asp | Met | Ser |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Arg | Asn | Leu | Ser | Ile | Lys | Asp | Glu | Leu | Leu | Gly | Glu | Glu | Arg | Ala | Glu |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Asn | Gln | Arg | Leu | Met | Leu | Ser | Leu | Met | Pro | Glu | Pro | Val | Met | Gln | Arg |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Tyr | Leu | Asp | Gly | Glu | Glu | Thr | Ile | Ala | Gln | Asp | His | Lys | Asn | Val | Thr |
|     |     |     | 485 |     |     |     |     | 490 |     |     |     |     |     | 495 |     |
| Val | Ile | Phe | Ala | Asp | Met | Met | Gly | Leu | Asp | Glu | Leu | Ser | Arg | Met | Leu |
|     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |     |
| Thr | Ser | Glu | Glu | Leu | Met | Val | Val | Val | Asn | Asp | Leu | Thr | Arg | Gln | Phe |
|     | 515 |     |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Asp | Ala | Ala | Ala | Glu | Ser | Leu | Gly | Val | Asp | His | Val | Arg | Thr | Leu | His |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |
| Asp | Gly | Tyr | Leu | Ala | Ser | Cys | Gly | Leu | Gly | Val | Pro | Arg | Leu | Asp | Asn |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |
| Val | Arg | Arg | Thr | Val | Asn | Phe | Ala | Ile | Glu | Met | Asp | Arg | Ile | Ile | Asp |
|     |     |     | 565 |     |     |     |     |     | 570 |     |     |     |     | 575 |     |
| Arg | His | Ala | Ala | Glu | Ser | Gly | His | Asp | Leu | Arg | Leu | Arg | Ala | Gly | Ile |
|     |     | 580 |     |     |     |     | 585 |     |     |     |     |     | 590 |     |     |
| Asp | Thr | Gly | Ser | Ala | Ala | Ser | Gly | Leu | Val | Gly | Arg | Ser | Thr | Leu | Ala |
|     | 595 |     |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |
| Tyr | Asp | Met | Trp | Gly | Ser | Ala | Val | Asp | Val | Ala | Asn | Gln | Val | Gln | Arg |

610                      615                      620  
 Gly Ser Pro Gln Pro Gly Ile Tyr Val Thr Ser Arg Val His Glu Val  
 625                      630                      635                      640  
 Met Gln Glu Thr Leu Asp Phe Val Ala Ala Gly Glu Val Val Gly Glu  
                     645                      650                      655  
 Arg Gly Val Glu Thr Val Trp Arg Leu Gln Gly His Arg Arg  
                     660                      665                      670

<210> 179  
 <211> 520  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 179  
 gtgatcgacg aaaccctctt ccatgccgag gagaagatgg agaaggccgt ctcggtggca 60  
 cccgacgacc tggcgctcgat tcgtaccggc cgcgcgaacc ccggcatgtt caaccggatc 120  
 aacatcgact actacggcgc ctccaccccg atcacgcagc tgtccagcat caacgtgccc 180  
 gaggcgcgca tgggtggtgat caagccctac gaggcgagcc agctgcgcct catcgaggat 240  
 gcgatccgca actccgacct cggcgctcaat ccgaccaacg acggcaacat catccgggtg 300  
 tcgatcccgc agctcaccga ggagcgccgc cgcgacctgg tcaagcaggc caaggccaag 360  
 ggcgaggacg ccaaggtgtc ggtgcgcaac atccgtcgca acgatatgaa cacctttcgc 420  
 atcgaccggg tacggctgcc gacgccaccg ccgtcgtaga agcgacagag gatcgcgagg 480  
 aacggtattg gccacgcctt ctgtggcggg ccgacaccac 520

<210> 180  
 <211> 1071  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 180  
 cgtggggaag gattgcactc tatgagcgaa atcgcccgtc cctggcggggt tctggcaggt 60  
 ggcacgcggt cctgcgcgcg gggatatgcc ggggtgctga gcatcgcggt caccacggcg 120  
 tcggcccagc cgggcctccc gcagcccccg ctgcccgcgc ctgccacagt gacgcaaacc 180  
 gtcacggttg cgcaccaacgc cgcgccacaa ctcatccgcg gcccgggtgt gacgcctgcc 240  
 accggcgggc accggcgggg gccgcgcggg gtgagcgccc cggcggtcgc gccggcccc 300  
 gcgctgcccg ccgcgcgggt gtccacgata ccccggcca cctcgggcac gctcagcgag 360  
 ttcttcgcgc ccaaggggcgt cactgatggag ccgcagtcca gccgcgactt ccgcgccttc 420  
 aacatcgtgc tgccgaagcc gcggggctgg gagcacatcc cggaccgaa cgtgccggac 480  
 gcgttcgcgg tgctggccga ccgggtcggc ggcaacggcc tgtactcgtc gaacgcccag 540  
 gtggtggtct acaaactcgt cggcgagttc gaccccaagg aagcgatcag ccacggcttc 600  
 gtcgacagcc agaagctgcc ggcgtggcgt tccaccgacg cgtcgctggc cgacttcggc 660  
 ggaatgccgt cctcgctgat cgagggcacc taccgcgaga acaacatgaa gctgaacacg 720  
 tcccggcgcc acgtcattgc caccgcgggg cccgaccact acctggtgtc gctgtcggtg 780  
 accaccagcg tcgaacaggc cgtggccgaa gccgcggagg ccaccgacgc gattgtcaac 840  
 ggcttcaagg tcagcgttcc ggggtccgggt ccggccgcac cgccacctgc acccggtgcc 900  
 cccggtgtcc cgcgcgcccc cggcgccccg gcgctgcgcg tggcgcgtcg accacccccg 960  
 gctcccgtcg ttcccgcggt ggcgccccgc ccacagctgc tgggactgca gggatagacg 1020  
 tcgtcgtccc ccgggcgaag cctggcgccc gggggacgac ggcccccttc t 1071

<210> 181  
 <211> 152  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 181  
 Val Ile Asp Glu Thr Leu Phe His Ala Glu Glu Lys Met Glu Lys Ala  
 1                      5                      10                      15

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Ser | Val | Ala | Pro | Asp | Asp | Leu | Ala | Ser | Ile | Arg | Thr | Gly | Arg | Ala |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Asn | Pro | Gly | Met | Phe | Asn | Arg | Ile | Asn | Ile | Asp | Tyr | Tyr | Gly | Ala | Ser |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Thr | Pro | Ile | Thr | Gln | Leu | Ser | Ser | Ile | Asn | Val | Pro | Glu | Ala | Arg | Met |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Val | Val | Ile | Lys | Pro | Tyr | Glu | Ala | Ser | Gln | Leu | Arg | Leu | Ile | Glu | Asp |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Ala | Ile | Arg | Asn | Ser | Asp | Leu | Gly | Val | Asn | Pro | Thr | Asn | Asp | Gly | Asn |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ile | Ile | Arg | Val | Ser | Ile | Pro | Gln | Leu | Thr | Glu | Glu | Arg | Arg | Arg | Asp |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Val | Lys | Gln | Ala | Lys | Ala | Lys | Gly | Glu | Asp | Ala | Lys | Val | Ser | Val |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Arg | Asn | Ile | Arg | Arg | Asn | Asp | Met | Asn | Thr | Phe | Arg | Ile | Ala | Pro | Val |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Arg | Leu | Pro | Thr | Pro | Pro | Pro | Ser |     |     |     |     |     |     |     |     |
| 145 |     |     |     |     |     | 150 |     |     |     |     |     |     |     |     |     |

<210> 182  
 <211> 331  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 182

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Glu | Ile | Ala | Arg | Pro | Trp | Arg | Val | Leu | Ala | Gly | Gly | Ile | Gly |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ala | Cys | Ala | Ala | Gly | Ile | Ala | Gly | Val | Leu | Ser | Ile | Ala | Val | Thr | Thr |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Ser | Ala | Gln | Pro | Gly | Leu | Pro | Gln | Pro | Pro | Leu | Pro | Ala | Pro | Ala |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Thr | Val | Thr | Gln | Thr | Val | Thr | Val | Ala | Pro | Asn | Ala | Ala | Pro | Gln | Leu |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ile | Pro | Arg | Pro | Gly | Val | Thr | Pro | Ala | Thr | Gly | Gly | Ala | Ala | Ala | Val |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Pro | Ala | Gly | Val | Ser | Ala | Pro | Ala | Val | Ala | Pro | Ala | Pro | Ala | Leu | Pro |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ala | Arg | Pro | Val | Ser | Thr | Ile | Ala | Pro | Ala | Thr | Ser | Gly | Thr | Leu | Ser |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Glu | Phe | Phe | Ala | Ala | Lys | Gly | Val | Thr | Met | Glu | Pro | Gln | Ser | Ser | Arg |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Asp | Phe | Arg | Ala | Leu | Asn | Ile | Val | Leu | Pro | Lys | Pro | Arg | Gly | Trp | Glu |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| His | Ile | Pro | Asp | Pro | Asn | Val | Pro | Asp | Ala | Phe | Ala | Val | Leu | Ala | Asp |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |
| Arg | Val | Gly | Gly | Asn | Gly | Leu | Tyr | Ser | Ser | Asn | Ala | Gln | Val | Val | Val |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Tyr | Lys | Leu | Val | Gly | Glu | Phe | Asp | Pro | Lys | Glu | Ala | Ile | Ser | His | Gly |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Phe | Val | Asp | Ser | Gln | Lys | Leu | Pro | Ala | Trp | Arg | Ser | Thr | Asp | Ala | Ser |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Leu | Ala | Asp | Phe | Gly | Gly | Met | Pro | Ser | Ser | Leu | Ile | Glu | Gly | Thr | Tyr |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Arg | Glu | Asn | Asn | Met | Lys | Leu | Asn | Thr | Ser | Arg | Arg | His | Val | Ile | Ala |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Thr | Ala | Gly | Pro | Asp | His | Tyr | Leu | Val | Ser | Leu | Ser | Val | Thr | Thr | Ser |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |

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Val Glu Gln Ala Val Ala Glu Ala Ala Glu Ala Thr Asp Ala Ile Val  
260 265 270  
Asn Gly Phe Lys Val Ser Val Pro Gly Pro Gly Pro Ala Ala Pro Pro  
275 280 285  
Pro Ala Pro Gly Ala Pro Gly Val Pro Pro Ala Pro Gly Ala Pro Ala  
290 295 300  
Leu Pro Leu Ala Val Ala Pro Pro Pro Ala Pro Ala Val Pro Ala Val  
305 310 315 320  
Ala Pro Ala Pro Gln Leu Leu Gly Leu Gln Gly  
325 330

<210> 183  
<211> 207  
<212> DNA  
<213> Mycobacterium vaccae

<400> 183  
acctacgagt tgcagaacaa gggtcacgggc ggccgcatcc cgcgcgagta catcccgtcg 60  
gtggatgccg gcgcgcagga cgccatgcag tacggcgtgc tggccggcta cccgctggtt 120  
aacgtcaagc tgacgtgtct cgacgggtgcc taccacgaag tcgactcgtc ggaaatggca 180  
ttcaaggttg ccggtctcca ggtcata 207

<210> 184  
<211> 69  
<212> PRT  
<213> Mycobacterium vaccae

<400> 184  
Thr Tyr Glu Phe Glu Asn Lys Val Thr Gly Gly Arg Ile Pro Arg Glu  
1 5 10 15  
Tyr Ile Pro Ser Val Asp Ala Gly Ala Gln Asp Ala Met Gln Tyr Gly  
20 25 30  
Val Leu Ala Gly Tyr Pro Leu Val Asn Val Lys Leu Thr Leu Leu Asp  
35 40 45  
Gly Ala Tyr His Glu Val Asp Ser Ser Glu Met Ala Phe Lys Val Ala  
50 55 60  
Gly Ser Gln Val Ile  
65

<210> 185  
<211> 898  
<212> DNA  
<213> Mycobacterium vaccae

<220>  
<221> unsure  
<222> (637)...(637)

<221> unsure  
<222> (662)...(662)

<400> 185  
cgacctccac ccggggcgtga ggccaaccac taggctggtc accagtagtc gacggcacac 60  
ttcaccgaaa aaatgaggac agaggagaca cccgtgacga tccgtgttgg tgtgaacggc 120  
ttcggccgta tcggacgcaa cttcttccgc gcgctggacg cgcagaaggc cgaaggcaag 180  
aacaaggaca tcgagatcgt cgcggtcaac gacctaccg acaacgccac gctggcgcac 240  
ctgctgaagt tcgactcgat cctggggccgg ctgccctacg acgtgagcct cgaaggcgag 300

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gacaccatcg tcgtcggcag caccaagatc aaggcgctcg aggtcaagga aggcccggcg 360  
gcgctgccct ggggcgacct gggcgtcgac gtcgtcgctcg agtccaccgg catcttcacc 420  
aagcgcgaca aggccagggg ccacctcgac gcggggcgcca agaagggtcat catctccgcg 480  
ccggccaccg atgaggacat caccatcgtg ctcggcgtca acgacgacaa gtacgacggc 540  
agccagaaca tcatctccaa cgcgtcgtgc accacgaact gcctcgggccc gctggcgaag 600  
gtcatcaacg acgagttcgg catcgtcaag ggcctgntga ccaccatcca cgcctacacc 660  
cnggtccaga acctgcagga cggcccgac aaggatctgc gccggggccc cgccgcccgcg 720  
ctgaacatcg tgccgacctc caccggtgcc gccaaaggcca tcggactggg gctgcccag 780  
ctgaagggca agctcgacgg ctacgcgctg cgggtgccga tccccaccgg ctcggtcacc 840  
gacctgaccg ccgagctggg caagtcggcc accgtggacg agatcaacgc cgcatga 898

<210> 186  
<211> 268  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (182)...(182)

<221> UNSURE  
<222> (190)...(190)

<400> 186

Val Thr Ile Arg Val Gly Val Asn Gly Phe Gly Arg Ile Gly Arg Asn  
1 5 10 15  
Phe Phe Arg Ala Leu Asp Ala Gln Lys Ala Glu Gly Lys Asn Lys Asp  
20 25 30  
Ile Glu Ile Val Ala Val Asn Asp Leu Thr Asp Asn Ala Thr Leu Ala  
35 40 45  
His Leu Leu Lys Phe Asp Ser Ile Leu Gly Arg Leu Pro Tyr Asp Val  
50 55 60  
Ser Leu Glu Gly Glu Asp Thr Ile Val Val Gly Ser Thr Lys Ile Lys  
65 70 75 80  
Ala Leu Glu Val Lys Glu Gly Pro Ala Ala Leu Pro Trp Gly Asp Leu  
85 90 95  
Gly Val Asp Val Val Val Glu Ser Thr Gly Ile Phe Thr Lys Arg Asp  
100 105 110  
Lys Ala Gln Gly His Leu Asp Ala Gly Ala Lys Lys Val Ile Ile Ser  
115 120 125  
Ala Pro Ala Thr Asp Glu Asp Ile Thr Ile Val Leu Gly Val Asn Asp  
130 135 140  
Asp Lys Tyr Asp Gly Ser Gln Asn Ile Ile Ser Asn Ala Ser Cys Thr  
145 150 155 160  
Thr Asn Cys Leu Gly Pro Leu Ala Lys Val Ile Asn Asp Glu Phe Gly  
165 170 175  
Ile Val Lys Gly Leu Xaa Thr Thr Ile His Ala Tyr Thr Xaa Val Gln  
180 185 190  
Asn Leu Gln Asp Gly Pro His Lys Asp Leu Arg Arg Ala Arg Ala Ala  
195 200 205  
Ala Leu Asn Ile Val Pro Thr Ser Thr Gly Ala Ala Lys Ala Ile Gly  
210 215 220  
Leu Val Leu Pro Glu Leu Lys Gly Lys Leu Asp Gly Tyr Ala Leu Arg  
225 230 235 240  
Val Pro Ile Pro Thr Gly Ser Val Thr Asp Leu Thr Ala Glu Leu Gly  
245 250 255  
Lys Ser Ala Thr Val Asp Glu Ile Asn Ala Ala Met

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208710 "E4T500T" 10051643 "011802

260

265

<210> 187  
<211> 41  
<212> PRT  
<213> Mycobacterium vaccae

<220>  
<221> UNSURE  
<222> (39)...(39)

<400> 187  
Met Asn Lys Ala Glu Leu Ile Asp Val Leu Thr Glu Lys Leu Gly Ser  
1 5 10 15  
Asp Arg Arg Gln Ala Thr Ala Ala Val Glu Asn Val Val Asp Thr Ile  
20 25 30  
Val Ala Ala Val Pro Lys Xaa Val Val  
35 40

<210> 188  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<221> unsure  
<222> (12)...(12)

<400> 188  
atgaayaarg cngarctsat ygaygt

26

<210> 189  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<400> 189  
atsgtrtgva cvacgttytc

20

<210> 190  
<211> 84  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Made in a lab

<221> unsure  
<222> (2)...(2)

<400> 190  
gnactcattg acgtactcac tgagaagctg ggctcggatt gtcggcaagc gactgcggca

60

84

```
<220>
<221> unsure
<222> (2) ... (2)
```

```
<220>
<221> UNSURE
<222> (1) . . . (1)
```

```
<210> 193
<211> 1164
<212> DNA
<213> Mycobacterium vaccae
```

83

ctggccgacc cggtgtggag caacagatgt tgcacctcac gggcgggtcgg accgcagcgc 480  
 atgcacgacg tcccgggtgcc gctggaggcg cttcccgcgg tggacgcggg ggtgatcagc 540  
 cagcaccact acgaccacct cgacatcgac accatcgtcg cgttggcgca caccagcgg 600  
 gccccgttcg tgggtgccgtt gggcatcggc gcacacctgc gcaagtgggg cgtccccgag 660  
 gcgcggatcg tcgagttgga ctggcacgaa gcccaccgca tagacgacct gacgctggtc 720  
 tgcacccccg cccggcactt ctccggacgg ttgttctccc gcgactcgac gctgtgggcg 780  
 tcgtgggtgg tcaccggctc gtgcgacaag gcgttcttcg gtggcgacac cggatacacg 840  
 aagagcttcg ccgagatcgg cgacgagtag ggtccgttcg atctgaccct gctgccgac 900  
 ggggcctacc atcccgcgtt cgccgacatc cacatgaacc ccgaggaggc ggtgcgcgcc 960  
 catctggacc tgaccgaggt ggacaacagc ctgatgggtc ccatccactg ggcgacattc 1020  
 cgctcgcgcc cgcacccgtg gtccgagccc gccgaacgcc tgctgaccgc tgccgacgcc 1080  
 gagcgggtac gcctgaccgt gccgattccc ggtcagcggg tggacccgga gtcgacgttc 1140  
 gacccgtggt ggcggttctg aacc 1164

<210> 194

<211> 370

<212> PRT

<213> *Mycobacterium vaccae*

<400> 194

Met Val Arg Ala Ala Leu Arg Tyr Gly Phe Gly Thr Ala Ser Leu Leu  
 1 5 10 15  
 Ala Gly Gly Phe Val Leu Arg Ala Leu Gln Gly Thr Pro Ala Ala Leu  
 20 25 30  
 Gly Ala Thr Pro Gly Glu Val Ala Pro Val Ala Arg Arg Ser Pro Asn  
 35 40 45  
 Tyr Arg Asp Gly Lys Phe Val Asn Leu Glu Pro Pro Ser Gly Ile Thr  
 50 55 60  
 Met Asp Arg Asp Leu Gln Arg Met Leu Leu Arg Asp Leu Ala Asn Ala  
 65 70 75 80  
 Ala Ser Gln Gly Lys Pro Pro Gly Pro Ile Pro Leu Ala Glu Pro Pro  
 85 90 95  
 Lys Gly Asp Pro Thr Pro Ala Pro Ala Ala Ser Trp Tyr Gly His  
 100 105 110  
 Ser Ser Val Leu Ile Glu Val Asp Gly Tyr Arg Val Leu Ala Asp Pro  
 115 120 125  
 Val Trp Ser Asn Arg Cys Ser Pro Ser Arg Ala Val Gly Pro Gln Arg  
 130 135 140  
 Met His Asp Val Pro Val Pro Leu Glu Ala Leu Pro Ala Val Asp Ala  
 145 150 155 160  
 Val Val Ile Ser His Asp His Tyr Asp His Leu Asp Ile Asp Thr Ile  
 165 170 175  
 Val Ala Leu Ala His Thr Gln Arg Ala Pro Phe Val Val Pro Leu Gly  
 180 185 190  
 Ile Gly Ala His Leu Arg Lys Trp Gly Val Pro Glu Ala Arg Ile Val  
 195 200 205  
 Glu Leu Asp Trp His Glu Ala His Arg Ile Asp Asp Leu Thr Leu Val  
 210 215 220  
 Cys Thr Pro Ala Arg His Phe Ser Gly Arg Leu Phe Ser Arg Asp Ser  
 225 230 235 240  
 Thr Leu Trp Ala Ser Trp Val Val Thr Gly Ser Ser His Lys Ala Phe  
 245 250 255  
 Phe Gly Gly Asp Thr Gly Tyr Thr Lys Ser Phe Ala Glu Ile Gly Asp  
 260 265 270  
 Glu Tyr Gly Pro Phe Asp Leu Thr Leu Leu Pro Ile Gly Ala Tyr His  
 275 280 285  
 Pro Ala Phe Ala Asp Ile His Met Asn Pro Glu Glu Ala Val Arg Ala

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290 295 300  
 His Leu Asp Leu Thr Glu Val Asp Asn Ser Leu Met Val Pro Ile His  
 305 310 315 320  
 Trp Ala Thr Phe Arg Leu Ala Pro His Pro Trp Ser Glu Pro Ala Glu  
 325 330 335  
 Arg Leu Leu Thr Ala Ala Asp Ala Glu Arg Val Arg Leu Thr Val Pro  
 340 345 350  
 Ile Pro Gly Gln Arg Val Asp Pro Glu Ser Thr Phe Asp Pro Trp Trp  
 355 360 365  
 Arg Phe  
 370

<210> 195  
 <211> 650  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 195  
 gacacaccag caccactgtt aacctcgcta gatcagtcgg ccgaacggaa ggacagccgt 60  
 gaccctgaaa accctagtca ccagcatgac cgctggggca gcagcagccg caacactcgg 120  
 cgctgccgcc gtgggtgtga cctcgattgc cgctgggtgcg ggtgtcgccg gcgcgtcgcc 180  
 cgcggtgctg aacgcaccgc tgetttccgc ccctgcccc gatctgcagg gaccgctggg 240  
 ctccaccttg agcgcgctgt cgggcccggg ctcttcgcc ggcgccaagg ccacctacgt 300  
 ccagggcggt ctgggcccga tcgaggcccc ggtggccgac agcggataca gcaacgccgc 360  
 ggccaagggc tacttcccgc tgagcttcac cgctgccggc atcgaccaga acggtccgat 420  
 cgtgaccgcc aacgtcaccg cggcgcccc gacggggcgc gtggccaccc agccgctgac 480  
 gttcatcgcc gggccgagcc cgaccggatg gcagctgtcc aagcagtcgg cactggccct 540  
 gatgtccgcg gtgggtgatc tcccgcacga ttctgggtcc cagcgccgtc acatgtgtgg 600  
 cggcgctcgg gctgggtggg tgccctgggcg gctgcgcgca agatgaacat 650

<210> 196  
 <211> 159  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 196  
 Met Thr Ala Gly Ala Ala Ala Ala Thr Leu Gly Ala Ala Ala Val  
 1 5 10 15  
 Gly Val Thr Ser Ile Ala Val Gly Ala Gly Val Ala Gly Ala Ser Pro  
 20 25 30  
 Ala Val Leu Asn Ala Pro Leu Leu Ser Ala Pro Ala Pro Asp Leu Gln  
 35 40 45  
 Gly Pro Leu Val Ser Thr Leu Ser Ala Leu Ser Gly Pro Gly Ser Phe  
 50 55 60  
 Ala Gly Ala Lys Ala Thr Tyr Val Gln Gly Gly Leu Gly Arg Ile Glu  
 65 70 75 80  
 Ala Arg Val Ala Asp Ser Gly Tyr Ser Asn Ala Ala Ala Lys Gly Tyr  
 85 90 95  
 Phe Pro Leu Ser Phe Thr Val Ala Gly Ile Asp Gln Asn Gly Pro Ile  
 100 105 110  
 Val Thr Ala Asn Val Thr Ala Ala Pro Thr Gly Ala Val Ala Thr  
 115 120 125  
 Gln Pro Leu Thr Phe Ile Ala Gly Pro Ser Pro Thr Gly Trp Gln Leu  
 130 135 140  
 Ser Lys Gln Ser Ala Leu Ala Leu Met Ser Ala Val Ile Ala Ala  
 145 150 155

<210> 197  
 <211> 285  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 197

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Val | Arg | Arg | Val | Leu | Gly | Ser | Val | Gly | Ala | Ala | Val | Ala | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Ala | Ala | Leu | Trp | Gln | Thr | Gly | Val | Ser | Ile | Pro | Thr | Ala | Ser | Ala |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Asp | Pro | Cys | Pro | Asp | Ile | Glu | Val | Ile | Phe | Ala | Arg | Gly | Thr | Gly | Ala |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Glu | Pro | Gly | Leu | Gly | Trp | Val | Gly | Asp | Ala | Phe | Val | Asn | Ala | Leu | Arg |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Lys | Val | Gly | Glu | Gln | Ser | Val | Gly | Thr | Tyr | Ala | Val | Asn | Tyr | Pro |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Ala | Gly | Phe | Asp | Phe | Asp | Lys | Ser | Ala | Pro | Met | Gly | Ala | Ala | Asp | Ala |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ser | Gly | Arg | Val | Gln | Trp | Met | Ala | Asp | Asn | Cys | Pro | Asp | Thr | Lys | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Leu | Gly | Gly | Met | Ser | Gln | Gly | Ala | Gly | Val | Ile | Asp | Leu | Ile | Thr |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Asp | Pro | Arg | Pro | Leu | Gly | Arg | Phe | Thr | Pro | Thr | Pro | Met | Pro | Pro |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Arg | Val | Ala | Asp | His | Val | Ala | Ala | Val | Val | Val | Phe | Gly | Asn | Pro | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Arg | Asp | Ile | Arg | Gly | Gly | Gly | Pro | Leu | Pro | Gln | Met | Ser | Gly | Thr | Tyr |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Pro | Lys | Ser | Ile | Asp | Leu | Cys | Ala | Leu | Asp | Asp | Pro | Phe | Cys | Ser |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Pro | Gly | Phe | Asn | Leu | Pro | Ala | His | Phe | Ala | Tyr | Ala | Asp | Asn | Gly | Met |
|     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |
| Val | Glu | Glu | Ala | Ala | Asn | Phe | Ala | Arg | Leu | Glu | Pro | Gly | Gln | Ser | Val |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Glu | Leu | Pro | Glu | Ala | Pro | Tyr | Leu | His | Leu | Phe | Val | Pro | Arg | Gly | Glu |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Val | Thr | Leu | Glu | Asp | Ala | Gly | Pro | Leu | Arg | Glu | Gly | Asp | Ala | Val | Arg |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Phe | Thr | Ala | Ser | Gly | Gly | Gln | Arg | Val | Thr | Ala | Thr | Ala | Pro | Ala | Glu |
|     |     |     | 260 |     |     |     | 265 |     |     |     |     |     | 270 |     |     |
| Ile | Leu | Val | Trp | Glu | Met | His | Ala | Gly | Leu | Gly | Ala | Ala |     |     |     |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |

<210> 198  
 <211> 743  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 198

|             |             |            |            |            |             |     |
|-------------|-------------|------------|------------|------------|-------------|-----|
| ggatccgcgcg | caccggctgg  | tgacgaccaa | gtacaaccgc | gcccgcacct | ggacggccga  | 60  |
| gaactccgctc | ggcatcggcg  | gcgcgtacct | gtgcatctac | gggatggagg | gccccggcgcg | 120 |
| ctatcagttc  | gtcggccgca  | ccaccaggt  | gtggagtcgt | taccgccaca | cggcgccggtt | 180 |
| cgaaccggga  | agtcctctggc | tgtgcgggtt | tttcgaccga | atttcgtggt | atccggtgtc  | 240 |
| ggccgaggag  | ctgctggaat  | tgcgagccga | catggccgca | ggccggggct | cggtcgacat  | 300 |
| caccgacggc  | gtgttctccc  | tgcgcgagca | cgaacggttc | ctggccgaca | acgccgacga  | 360 |
| catcgccgcg  | ttccgttccc  | ggcaggcggc | cgcgttctcc | gccgagcgga | ccgcgtgggc  | 420 |
| ggccgccggc  | gagttcgacc  | gcgccgagaa | agccgcgtcg | aaggccaccg | acgccgatac  | 480 |

|            |            |            |             |            |            |     |
|------------|------------|------------|-------------|------------|------------|-----|
| cggggacctg | gtgctctacg | acggtgacga | gcggggtcgac | gctccgttcg | cgtegagcgt | 540 |
| gtggaaggtc | gacgtcgccg | tcggtgaccg | gggtggtggcc | ggacagccgt | tgctggcgct | 600 |
| ggaggcgatg | aagatggaga | ccgtgctgcg | cgccccggcc  | gacggggtgg | tcacccagat | 660 |
| cctggtctcc | gctgggcatc | tcgtcgatcc | cggcacccca  | ctggtcgtgg | tcggcaccgg | 720 |
| agtgcgcgca | tgagcgccgt | cga        |             |            |            | 743 |

<210> 199  
 <211> 243  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 199

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Pro | Arg | His | Arg | Leu | Val | Thr | Thr | Lys | Tyr | Asn | Pro | Ala | Arg | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Trp | Thr | Ala | Glu | Asn | Ser | Val | Gly | Ile | Gly | Gly | Ala | Tyr | Leu | Cys | Ile |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Tyr | Gly | Met | Glu | Gly | Pro | Gly | Gly | Tyr | Gln | Phe | Val | Gly | Arg | Thr | Thr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gln | Val | Trp | Ser | Arg | Tyr | Arg | His | Thr | Ala | Pro | Phe | Glu | Pro | Gly | Ser |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Trp | Leu | Leu | Arg | Phe | Phe | Asp | Arg | Ile | Ser | Trp | Tyr | Pro | Val | Ser |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |
| Ala | Glu | Glu | Leu | Leu | Glu | Leu | Arg | Ala | Asp | Met | Ala | Ala | Gly | Arg | Gly |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     | 95  |     |     |
| Ser | Val | Asp | Ile | Thr | Asp | Gly | Val | Phe | Ser | Leu | Ala | Glu | His | Glu | Arg |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Phe | Leu | Ala | Asp | Asn | Ala | Asp | Asp | Ile | Ala | Ala | Phe | Arg | Ser | Arg | Gln |
|     | 115 |     |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Ala | Ala | Ala | Phe | Ser | Ala | Glu | Arg | Thr | Ala | Trp | Ala | Ala | Ala | Gly | Glu |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Phe | Asp | Arg | Ala | Glu | Lys | Ala | Ala | Ser | Lys | Ala | Thr | Asp | Ala | Asp | Thr |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |     |
| Gly | Asp | Leu | Val | Leu | Tyr | Asp | Gly | Asp | Glu | Arg | Val | Asp | Ala | Pro | Phe |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Ala | Ser | Ser | Val | Trp | Lys | Val | Asp | Val | Ala | Val | Gly | Asp | Arg | Val | Val |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ala | Gly | Gln | Pro | Leu | Leu | Ala | Leu | Glu | Ala | Met | Lys | Met | Glu | Thr | Val |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Leu | Arg | Ala | Pro | Ala | Asp | Gly | Val | Val | Thr | Gln | Ile | Leu | Val | Ser | Ala |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Gly | His | Leu | Val | Asp | Pro | Gly | Thr | Pro | Leu | Val | Val | Val | Gly | Thr | Gly |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |     |
| Val | Arg | Ala |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 200  
 <211> 858  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 200

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| gaaatcccg  | gtctgaaacc | ctcttttcgc | ggcgcccctc | aggacggtaa | gggggccaag | 60  |
| cggattgaaa | aatgttcgct | gaatgagcct | gaaattgcgc | gtggctcttg | gaaatcagca | 120 |
| cgatgggtt  | taccgtgtcc | actagtcggt | ccaaagagga | ccactggttt | tcggagggtt | 180 |
| tgcatgaaca | aagcagagct | catcgacgta | ctcactgaga | agctgggctc | ggatcgtcgg | 240 |
| caagcgactg | cggcggttga | gaacgttgtc | gacaccatcg | tgcgcgccgt | gcacaagggg | 300 |
| gagagcgta  | ccatcacggg | cttcggtgtt | ttcgagcagc | gtcgtcgcgc | agcacgcgtg | 360 |
| gcacgcaatc | cgcgcaccgg | cgagaccgtg | aaggtcaagc | ccacctcagt | cccggcattc | 420 |

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|            |            |            |             |            |            |     |
|------------|------------|------------|-------------|------------|------------|-----|
| cgccccggcg | ctcagttcaa | ggctgttgtc | tctggcgcac  | agaagcttcc | ggccgagggc | 480 |
| ccggcggtca | agcgcggtgt | gaccgcgacg | agcaccgccc  | gcaaggcagc | caagaaggct | 540 |
| ccggccaaga | aggctgccgc | gaagaaggcc | gcgcccggcca | agaaggctcc | ggcgaagaag | 600 |
| gctgcgacca | aggctgcacc | ggccaagaag | gccactgccg  | ccaagaaggc | cgcgccggcc | 660 |
| aagaaggcca | ctgccgcca  | gaaggctgca | ccggccaaga  | aggctccggc | caagaaggct | 720 |
| gcgaccaagg | ctgcaccggc | caagaaggct | ccggccaaga  | aggccgcgac | caaggctgca | 780 |
| ccggccaaga | aggctccggc | cgccaagaag | gcgcccggcca | agaaggctcc | ggccaagcgc | 840 |
| ggcgacgcga | agtaagtc   |            |             |            |            | 858 |

<210> 201  
 <211> 223  
 <212> PRT  
 <213> Mycobacterium vaccae

<400> 201

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asn | Lys | Ala | Glu | Leu | Ile | Asp | Val | Leu | Thr | Glu | Lys | Leu | Gly | Ser |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Asp | Arg | Arg | Gln | Ala | Thr | Ala | Ala | Val | Glu | Asn | Val | Val | Asp | Thr | Ile |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Val | Arg | Ala | Val | His | Lys | Gly | Glu | Ser | Val | Thr | Ile | Thr | Gly | Phe | Gly |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Val | Phe | Glu | Gln | Arg | Arg | Arg | Ala | Ala | Arg | Val | Ala | Arg | Asn | Pro | Arg |
|     | 50  |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |     |
| Thr | Gly | Glu | Thr | Val | Lys | Val | Lys | Pro | Thr | Ser | Val | Pro | Ala | Phe | Arg |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Pro | Gly | Ala | Gln | Phe | Lys | Ala | Val | Val | Ser | Gly | Ala | Gln | Lys | Leu | Pro |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Ala | Glu | Gly | Pro | Ala | Val | Lys | Arg | Gly | Val | Thr | Ala | Thr | Ser | Thr | Ala |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Arg | Lys | Ala | Ala | Lys | Lys | Ala | Pro | Ala | Lys | Lys | Ala | Ala | Ala | Lys | Lys |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     |     | 125 |     |     |
| Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Lys | Lys | Ala | Ala | Thr | Lys | Ala |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Ala | Pro | Ala | Lys | Lys | Ala | Thr | Ala | Ala | Lys | Lys | Ala | Ala | Pro | Ala | Lys |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |     |
| Lys | Ala | Thr | Ala | Ala | Lys | Lys | Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Lys | Lys | Ala | Ala | Thr | Lys | Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Lys |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Lys | Ala | Ala | Thr | Lys | Ala | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Ala | Lys |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Lys | Ala | Pro | Ala | Lys | Lys | Ala | Pro | Ala | Lys | Arg | Gly | Gly | Arg | Lys |     |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |

<210> 202  
 <211> 570  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 202

|            |            |             |            |            |            |     |
|------------|------------|-------------|------------|------------|------------|-----|
| agacagacag | tgatcgacga | aaccctcttc  | catgccgagg | agaagatgga | gaaggccgtc | 60  |
| tcggtggcac | ccgacgacct | ggcgctcgatt | cgtaccggcc | gcgcgaaccc | cggcatgttc | 120 |
| aaccggatca | acatcgacta | ctacggcgcc  | tccaccccga | tcacgcagct | gtccagcatc | 180 |
| aacgtgcccc | aggcgcgcat | ggtggtgac   | aagccctacg | aggcgagcca | gctgcgcctc | 240 |
| atcgaggatg | cgatccgcaa | ctccgacctc  | ggcgtaaatc | cgaccaacga | cggcaacatc | 300 |
| atccgggtgt | cgatcccgcg | gtccaccgag  | gagcgccgcc | gcgacctggt | caagcaggcc | 360 |
| aaggccaagg | gcgaggacgc | caagggtgtcg | gtgcgcaaca | tccgtcgcaa | ggcgatggag | 420 |



|            |            |             |             |            |             |     |
|------------|------------|-------------|-------------|------------|-------------|-----|
| gaactctccc | ggatcaagaa | ggacggcgac  | gccggcggaag | accaagtgc  | ccgcgccgag  | 480 |
| aaggatctcg | acaagagcac | ccaccagtac  | acgaatcaga  | tcgacgaact | gggtcaagcac | 540 |
| aaggaaggcg | agttgctgga | gggtctgacca |             |            |             | 570 |

<210> 203  
 <211> 187  
 <212> PRT  
 <213> Mycobacterium vaccae

<220>  
 <221> UNSURE  
 <222> (186)...(186)

<400> 203

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Ile | Asp | Glu | Thr | Leu | Phe | His | Ala | Glu | Glu | Lys | Met | Glu | Lys | Ala |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Val | Ser | Val | Ala | Pro | Asp | Asp | Leu | Ala | Ser | Ile | Arg | Thr | Gly | Arg | Ala |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Asn | Pro | Gly | Met | Phe | Asn | Arg | Ile | Asn | Ile | Asp | Tyr | Tyr | Gly | Ala | Ser |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Thr | Pro | Ile | Thr | Gln | Leu | Ser | Ser | Ile | Asn | Val | Pro | Glu | Ala | Arg | Met |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Val | Val | Ile | Lys | Pro | Tyr | Glu | Ala | Ser | Gln | Leu | Arg | Leu | Ile | Glu | Asp |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Ala | Ile | Arg | Asn | Ser | Asp | Leu | Gly | Val | Asn | Pro | Thr | Asn | Asp | Gly | Asn |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ile | Ile | Arg | Val | Ser | Ile | Pro | Gln | Leu | Thr | Glu | Glu | Arg | Arg | Arg | Asp |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Val | Lys | Gln | Ala | Lys | Ala | Lys | Gly | Glu | Asp | Ala | Lys | Val | Ser | Val |
|     |     | 115 |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Arg | Asn | Ile | Arg | Arg | Lys | Ala | Met | Glu | Glu | Leu | Ser | Arg | Ile | Lys | Lys |
|     | 130 |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |     |
| Asp | Gly | Asp | Ala | Gly | Glu | Asp | Glu | Val | Thr | Arg | Ala | Glu | Lys | Asp | Leu |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     | 160 |     |
| Asp | Lys | Ser | Thr | His | Gln | Tyr | Thr | Asn | Gln | Ile | Asp | Glu | Leu | Val | Lys |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| His | Lys | Glu | Gly | Glu | Leu | Leu | Glu | Val | Xaa | Pro |     |     |     |     |     |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     |     |     |     |

<210> 204  
 <211> 1364  
 <212> DNA  
 <213> Mycobacterium vaccae

<400> 204

|            |             |             |             |             |             |     |
|------------|-------------|-------------|-------------|-------------|-------------|-----|
| cgacctccac | ccggggcgtga | ggccaaccac  | taggctggtc  | accagtagtc  | gacggcacac  | 60  |
| ttcaccgaaa | aaatgaggac  | agaggagaca  | cccgtgacga  | tccgtgttgg  | tgtgaacggc  | 120 |
| ttcggccgta | tcggacgcaa  | cttcttccgc  | gcgctggacg  | cgcagaaggc  | cgaaggcaag  | 180 |
| aacaaggaca | tcgagatcgt  | cgcggtcaac  | gacctcaccg  | acaacgccac  | gctggcgcac  | 240 |
| ctgctgaagt | tcgactcgat  | cctggggccgg | ctgccctacg  | acgtgagcct  | cgaaggcgag  | 300 |
| gacaccatcg | tcgtcggcag  | caccaagatc  | aaggcgctcg  | aggtcaagga  | aggcccggcg  | 360 |
| gcgctgcctt | ggggcgacct  | gggcgtcgac  | gtcgtcgctg  | agtccaccgg  | catcttcacc  | 420 |
| aagcgcgaca | aggcccaggg  | ccacctcgac  | cgcggcgcca  | agaagggtcat | catctccgcy  | 480 |
| ccggccaccg | atgaggagcat | caccatcgty  | ctcggcgctca | acgacgacaa  | gtacgacggc  | 540 |
| agccagaaca | tcattctccaa | cgcgtcgtyc  | accacgaact  | gcctcggccc  | gctggcggaag | 600 |
| gtcatcaacg | acgagttcgg  | catcgctcaag | ggcctgatga  | ccaccatcca  | cgcctacacc  | 660 |
| caggtccaga | acctgcagga  | cggcccgcac  | aaggatctgc  | gccggggccc  | cgccggccgcg | 720 |

ctgaacatcg tgccgacctc caccggtgcc gccaaaggcca tcggactggt gctgcccag 780  
 ctgaagggca agctcgacgg ctacgcgctg cgggtgccga tccccaccgg ctcggtcacc 840  
 gacctgaccg ccgagctggg caagtcggcc accgtggacg agatcaacgc cgcgatgaag 900  
 gctgcggccg agggcccgct caagggcatc ctcaagtact acgacgcccc gatcgtgtcc 960  
 agcgacatcg tcaccgatcc gcacagctcg atcttcgact cgggtctgac caaggtcatc 1020  
 gacaaccagg ccaaggctcg gtccctggtac gacaacgagt ggggctactc caaccgcctc 1080  
 gtcgacctgg tcgccctggg cggcaagtcg ctgtaggggc gagcgaagcg acgggagaac 1140  
 agaggcgcca tggcgatcaa gtcactcgac gaccttctgt ccgaaggggt gacggggcgg 1200  
 ggcgtactcg tgcgctccga cctgaacgtc cccctcgacg gcgacacgat caccgacccg 1260  
 gggcgcatca tcgcctcggg gccgacgttg aaggcggtga gtgacgccg cgccaaggtg 1320  
 gtcgtcaccg cgcattctggg caggcccaag ggtgagccgg atcc 1364

<210> 205

<211> 340

<212> PRT

<213> Mycobacterium vaccae

<400> 205

Val Thr Ile Arg Val Gly Val Asn Gly Phe Gly Arg Ile Gly Arg Asn  
 1 5 10 15  
 Phe Phe Arg Ala Leu Asp Ala Gln Lys Ala Glu Gly Lys Asn Lys Asp  
 20 25 30  
 Ile Glu Ile Val Ala Val Asn Asp Leu Thr Asp Asn Ala Thr Leu Ala  
 35 40 45  
 His Leu Leu Lys Phe Asp Ser Ile Leu Gly Arg Leu Pro Tyr Asp Val  
 50 55 60  
 Ser Leu Glu Gly Glu Asp Thr Ile Val Val Gly Ser Thr Lys Ile Lys  
 65 70 75 80  
 Ala Leu Glu Val Lys Glu Gly Pro Ala Ala Leu Pro Trp Gly Asp Leu  
 85 90 95  
 Gly Val Asp Val Val Val Glu Ser Thr Gly Ile Phe Thr Lys Arg Asp  
 100 105 110  
 Lys Ala Gln Gly His Leu Asp Ala Gly Ala Lys Lys Val Ile Ile Ser  
 115 120 125  
 Ala Pro Ala Thr Asp Glu Asp Ile Thr Ile Val Leu Gly Val Asn Asp  
 130 135 140  
 Asp Lys Tyr Asp Gly Ser Gln Asn Ile Ile Ser Asn Ala Ser Cys Thr  
 145 150 155 160  
 Thr Asn Cys Leu Gly Pro Leu Ala Lys Val Ile Asn Asp Glu Phe Gly  
 165 170 175  
 Ile Val Lys Gly Leu Met Thr Thr Ile His Ala Tyr Thr Gln Val Gln  
 180 185 190  
 Asn Leu Gln Asp Gly Pro His Lys Asp Leu Arg Arg Ala Arg Ala Ala  
 195 200 205  
 Ala Leu Asn Ile Val Pro Thr Ser Thr Gly Ala Ala Lys Ala Ile Gly  
 210 215 220  
 Leu Val Leu Pro Glu Leu Lys Gly Lys Leu Asp Gly Tyr Ala Leu Arg  
 225 230 235 240  
 Val Pro Ile Pro Thr Gly Ser Val Thr Asp Leu Thr Ala Glu Leu Gly  
 245 250 255  
 Lys Ser Ala Thr Val Asp Glu Ile Asn Ala Ala Met Lys Ala Ala Ala  
 260 265 270  
 Glu Gly Pro Leu Lys Gly Ile Leu Lys Tyr Tyr Asp Ala Pro Ile Val  
 275 280 285  
 Ser Ser Asp Ile Val Thr Asp Pro His Ser Ser Ile Phe Asp Ser Gly  
 290 295 300  
 Leu Thr Lys Val Ile Asp Asn Gln Ala Lys Val Val Ser Trp Tyr Asp

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Ala Leu Pro Gln Leu Thr Asp Glu Gln Arg Ala Ala  
1 5 10

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